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between MAP based and Diameter based interfaces
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Foreword

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Introduction

The content of this specification is a part of overall solution to meet the requirement of the interworking between EPS and the legacy system, mainly for the interfaces between S4-SGSN/MME and HSS/HLR/EIR.

1 Scope

The present document is to specify the InterWorking Function (IWF) between MAP-based Gr, Gf interfaces and Diameter-based S6a, S6d, S13, S13a interfaces.

For each IWF scenario, the present document will specify the mapping of related procedures and the corresponding parameter handling.

The present document will also specify the related mechanisms for the IWF, e.g. message routing, user data handling. The other mechanism, such as security, will also be described in this document as a part of the whole solution.

If there is no specific indication, the SGSN in the specification refers to a S4-SGSN which supports S4 interface.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 33.401: "3GPP System Architecture Evolution: Security Architecture".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

example: text used to clarify abstract rules by applying them literally.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

<symbol> <Explanation>

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

EPS Evolved Packet System
IWF Interworking Function
TAU Tracking Area Update

4 Introduction (Informative)

4.1 General Description

The interworking scenarios in this specification are described based on interface mapping.

The stage 2 network deployments for each of the interworking scenarios are also described.

4.2 Scenario One: S6a/S6d - Pre Rel8 Gr interworking scenario with one IWF

4.2.1 General Description

This interworking scenario is for S6a/S6d interface based on Diameter and Pre Rel8 Gr interface based on MAP with one IWF in the path.

This IWF scenario can be an inter PLMN use case.

This IWF scenario can be an intra PLMN use case for operator to do the partly update of their legacy network.

This interworking scenario is described as below:

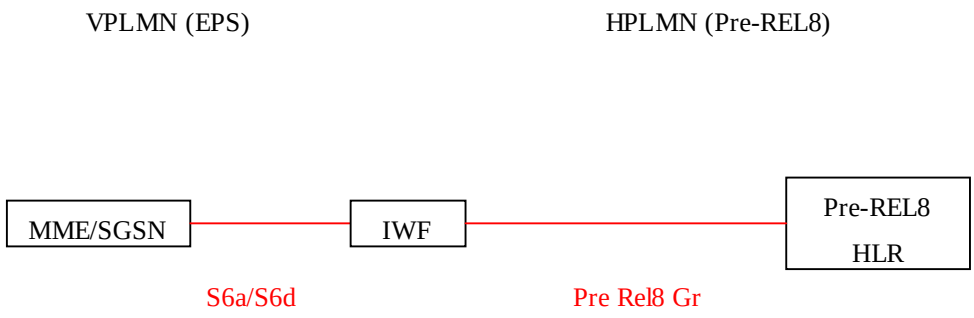


Figure 4.2.1-1 S6a/S6d - Pre Rel8 Gr interworking scenario with one IWF

The Pre Rel8 HLR shall be upgraded to support Rel-8 EPS security and Pre Rel8 Gr shall be upgraded to support transfer of Rel-8 security parameters..

4.2.2 Network Deployments

This IWF scenario will apply the following network deployment situation:

- Users of a Pre Rel8 UMTS/GPRS network access into a visited EPS with only E-UTRAN, which is described as below:

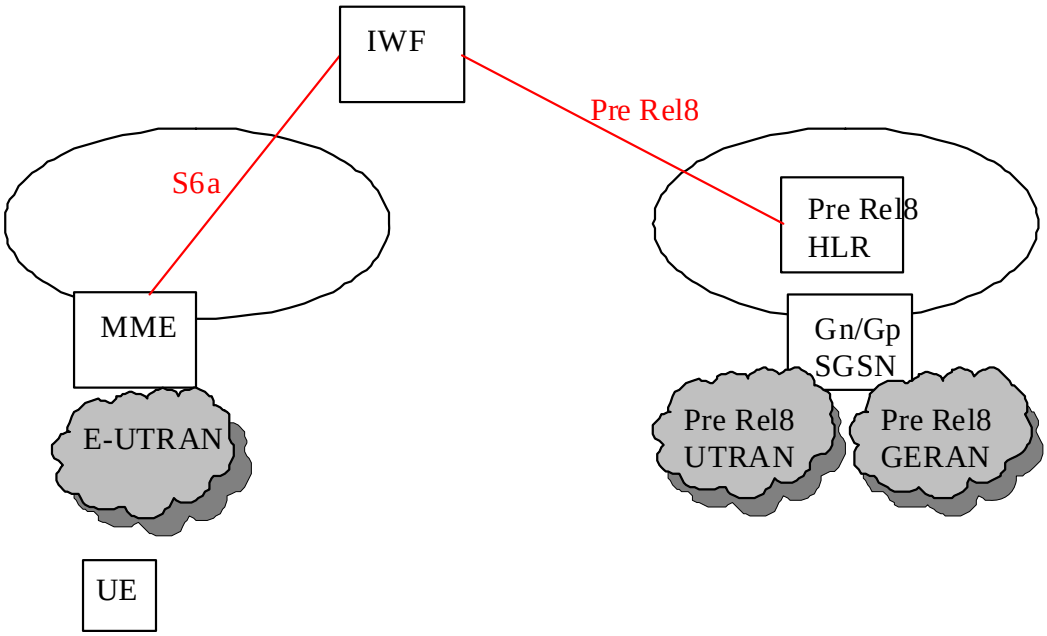


Figure 4.2.2-1 IWF Scenario one network deployment: visited EPS with E-UTRAN only, home Pre Rel8 UMTS/GPRS only

The subscription data for Pre Rel8 Gn/Gp SGSN is downloaded to MME. Mapping of the subscription data is done on MME. Additional security solution is needed in which the Pre Rel8 HLR can not be changed.

- Users of a Pre Rel8 UMTS/GPRS network access into a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

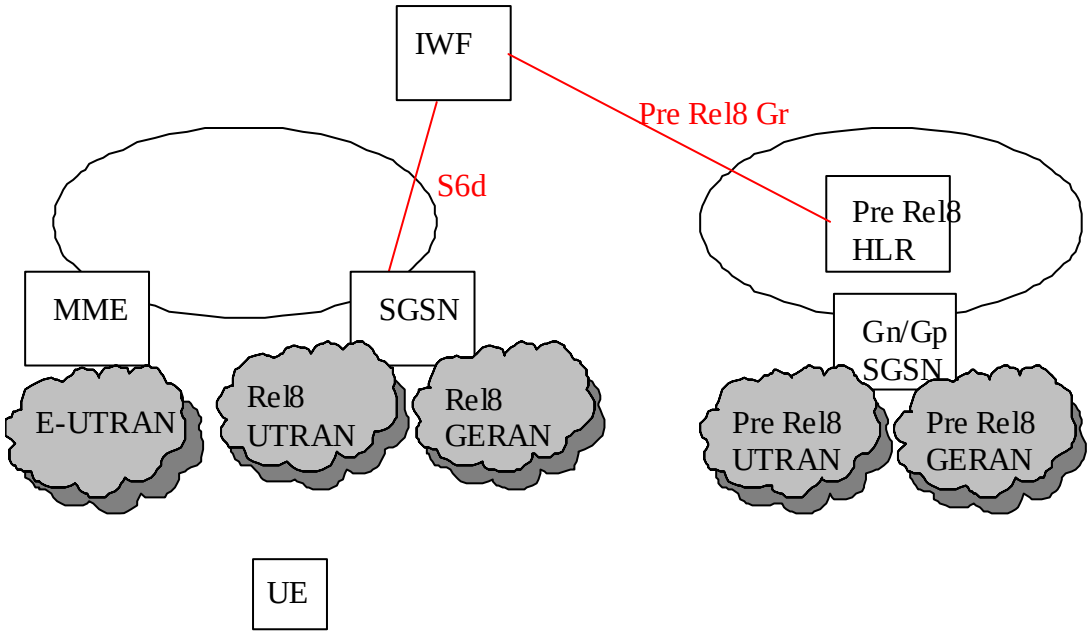


Figure 4.2.2-2 IWF Scenario one network deployment: visited EPS with E-UTRAN and UTRAN/GERAN, home Pre Rel8 UMTS/GPRS only

The subscription data for Pre Rel8 Gn/Gp SGSN is downloaded toSGSN. Mapping of the subscription data is done on SGSN. Security solution is not needed because the security mechanism in visited and home network is the same.

4.3 Scenario Two: S6a/S6d - Rel8 Gr interworking scenario with one IWF

4.3.1 General Description

This interworking scenario is for S6a/S6d interface based on Diameter and Rel8 Gr interface based on MAP with one IWF in the path.

This IWF scenario can be an inter PLMN use case.

This IWF scenario can be an intra PLMN use case for operator to do the partly update of their legacy network.

This interworking scenario is described as below:

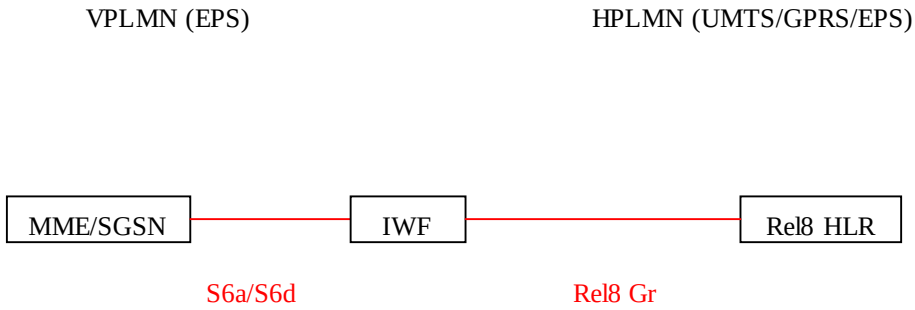


Figure 4.3.1-1 S6a/S6d - Rel8 Gr interworking scenario with one IWF

4.3.2 Network Deployments

This IWF scenario will apply the following network deployment situation:

- Users of a Rel8 UMTS/GPRS network access into a visited EPS with only E-UTRAN, which is described as below:

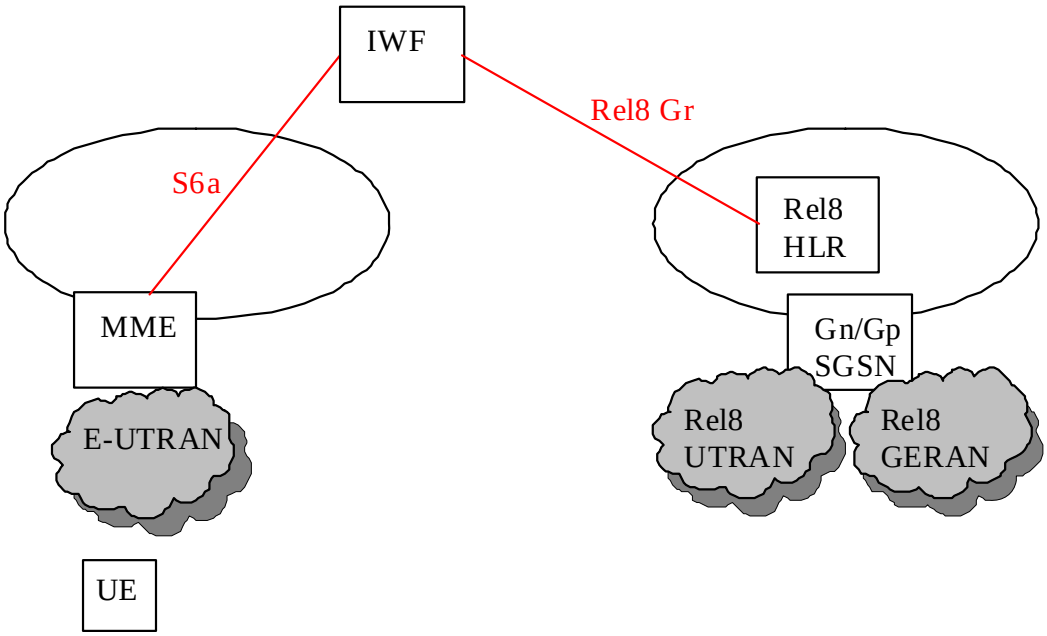


Figure 4.3.2-1 IWF Scenario two network deployment: visited EPS with E-UTRAN only, home Rel8 UMTS/GPRS only

The subscription data for Rel8 Gn/Gp SGSN is downloaded to MME. Mapping of the subscription data is done on MME. Additional security solution is needed in which the Pre Rel8 HLR can be changed.

- Users of a Rel8 UMTS/GPRS network access into a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

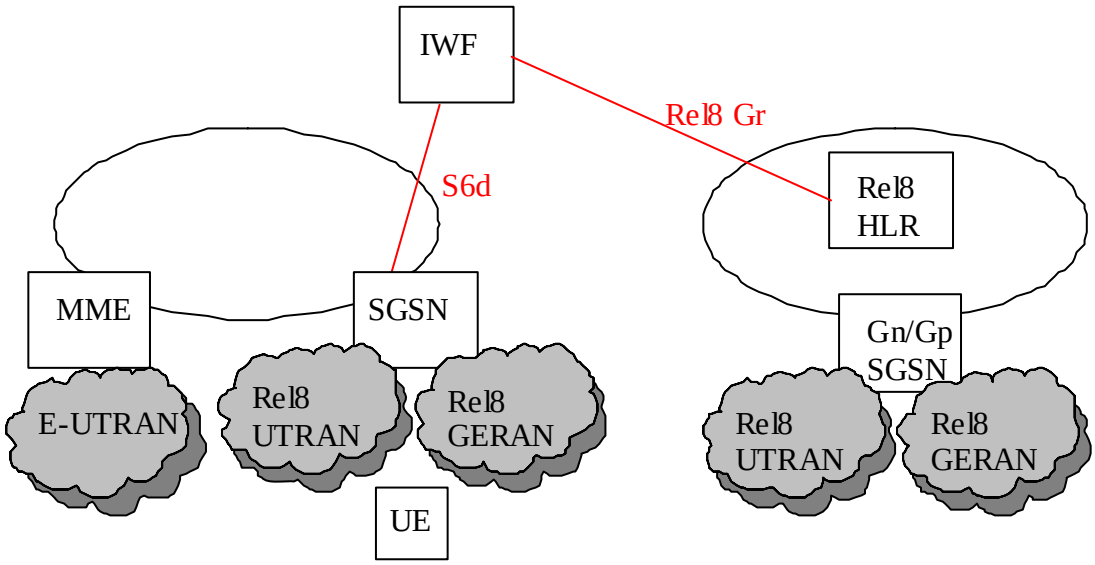


Figure 4.3.2-2 IWF Scenario two network deployment: visited EPS with E-UTRAN and UTRAN/GERAN, home Rel8 UMTS/GPRS only

The subscription data for Rel8 Gn/Gp SGSN is downloaded to SGSN. Mapping of the subscription data is done on SGSN. Security solution is not needed because the security mechanism in visited and home network is the same.

- Users of a Pre Rel8 UMTS/GPRS/E-UTRAN network access into a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

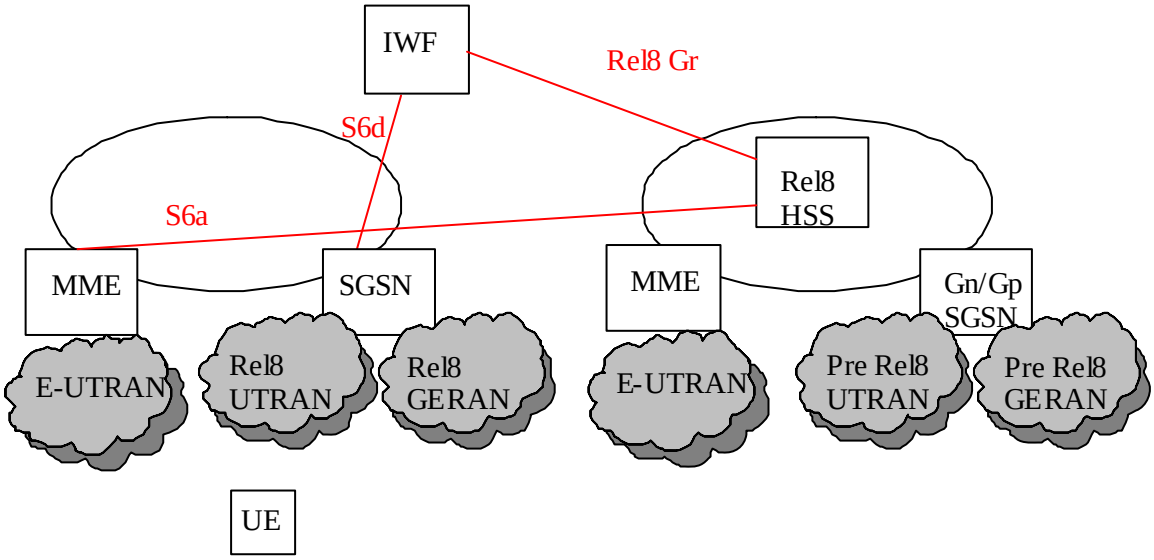


Figure 4.3.2-3 IWF Scenario two network deployment: visited EPS with E-UTRAN and UTRAN/GERAN, home EPS with E-UTRAN only and Pre Rel8 UMTS/GPRS

The subscription data for Pre Rel8 Gn/Gp SGSN and the subscription data for MME is downloaded to SGSN. Mapping of the subscription data is done on SGSN. Security solution is not needed because the security mechanism in visited and home network is the same.

4.4 Scenario Three: S6a/S6d - S6a/S6d interworking scenario with two IWFs

4.4.1 General Description

This interworking scenario is for S6a/S6d interface based on Diameter, S6a/S6d interface based on Diameter and SS7/MAP based roaming agreement with two IWFs in the path.

With this interworking scenario, two EPS operators can reuse the SS7 based roaming agreement.

This IWF scenario can only be an inter PLMN use case in which the two IWFs are in the VPLMN and HPLMN separately.

This interworking scenario is described as below:

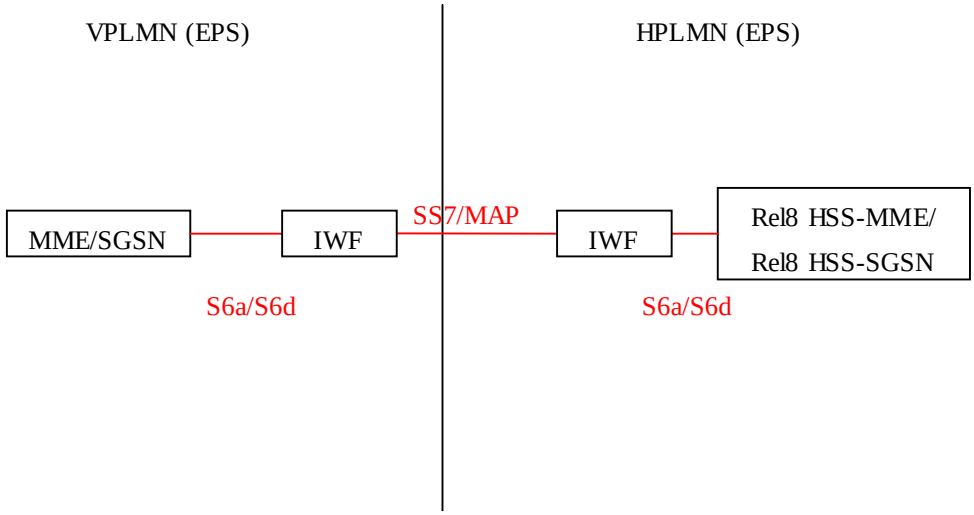


Figure 4.4.1-1 S6a/S6d - S6a/S6d interworking scenario with two IWFs

4.4.2 Network Deployments

This IWF scenario will apply the following network deployment situation:

- Users of a Pre Rel8 UMTS/GPRS/EPS for UTRAN/GERAN and E-UTRAN network access into a visited EPS with only E-UTRAN, which is described as below:

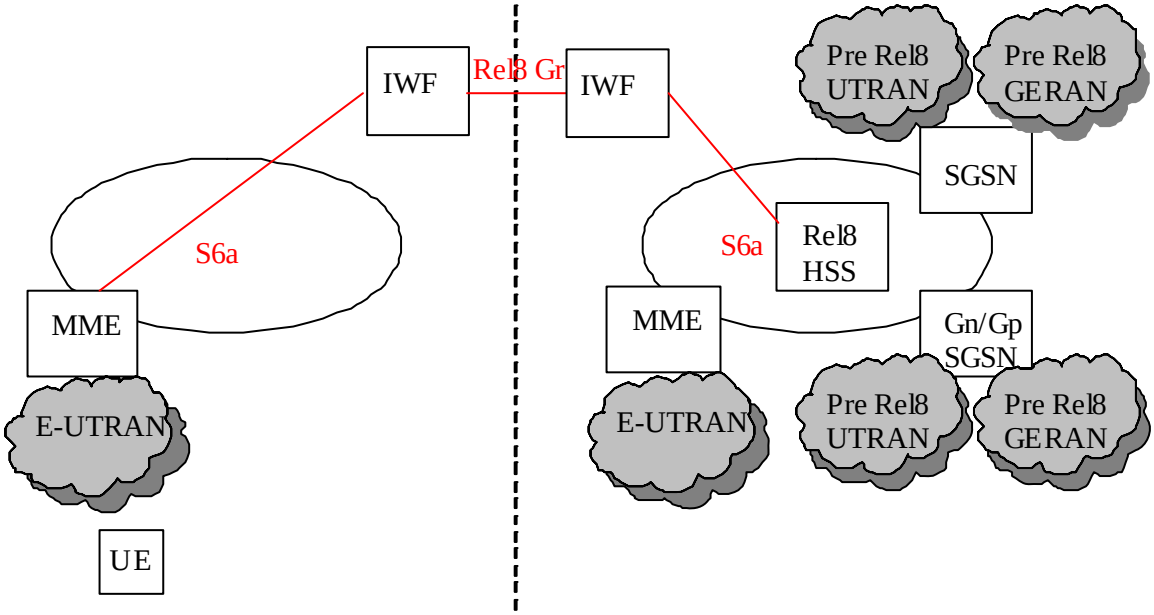


Figure 4.4.2-1 IWF Scenario three network deployment: visited EPS with E-UTRAN only, home EPS with E-UTRAN and UTRAN/GERAN and Pre Rel8 UMTS/GPRS

The subscription data for Pre Rel8 Gn/Gp SGSN, subscription data for SGSN and the subscription data for MME is downloaded to MME. MME picks up the subscription data for MME and discards the subscription data for Pre Rel8 UMTS/GPRS and the subscription data for SGSN.

- Users of a Pre Rel8 UMTS/GPRS/EPS for UTRAN/GERAN and E-UTRAN network access into a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

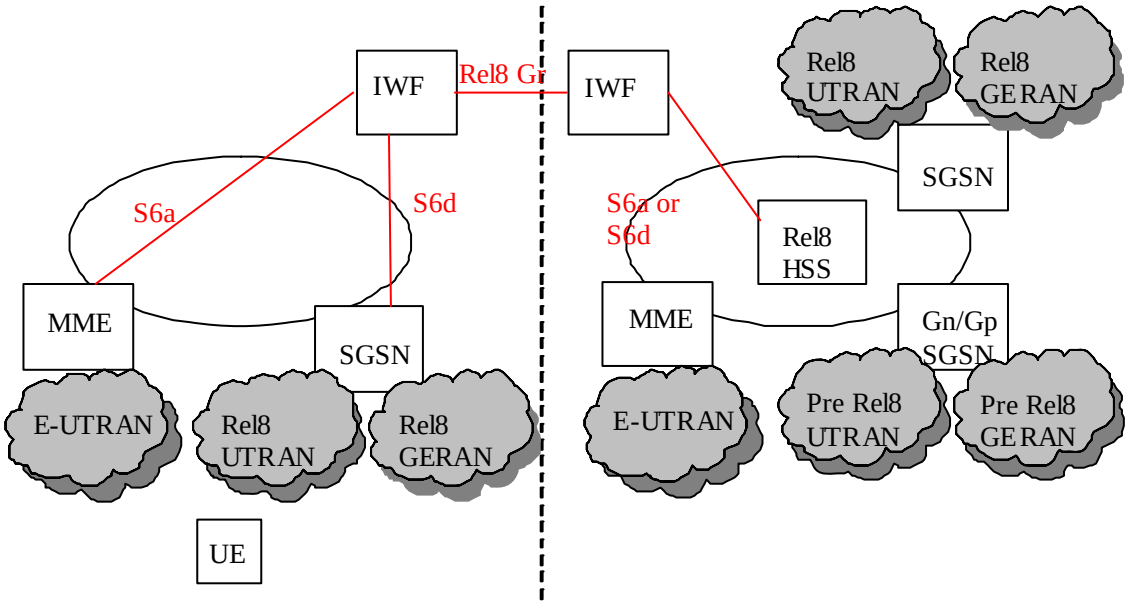


Figure 4.4.2-2 IWF Scenario three network deployment: visited EPS with E-UTRAN only and UTRAN/GERAN, home EPS with E-UTRAN and UTRAN/GERAN and Pre Rel8 UMTS/GPRS

The subscription data for Pre Rel8 Gn/Gp SGSN, subscription data for SGSN and the subscription data for MME is downloaded to SGSN or MME. SGSN or MME picks up the subscription data forSGSN or MME and discards the subscription data for Pre Rel8 UMTS/GPRS and the subscription data for MME or SGSN.

- Users of an EPS for UTRAN/GERAN and E-UTRAN network access into a visited EPS with only E-UTRAN, which is described as below:

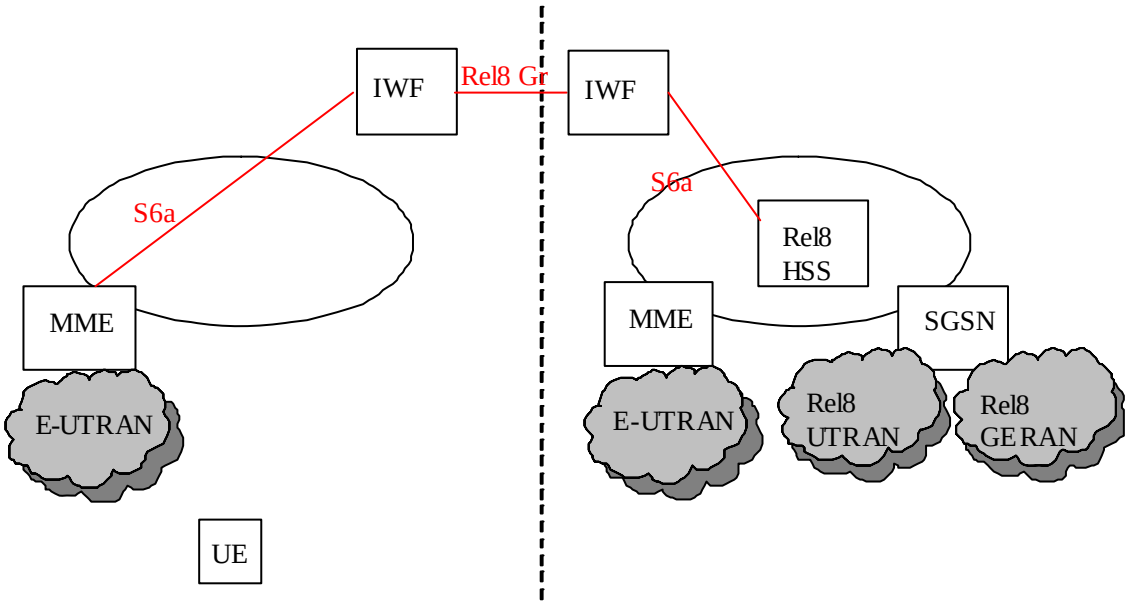


Figure 4.4.2-3 IWF Scenario three network deployment: visited EPS with E-UTRAN only, home EPS with E-UTRAN and UTRAN/GERAN

The subscription data for SGSN and the subscription data for MME is downloaded to MME. MME picks up the subscription data for MME and discards the subscription data for the subscription data for SGSN.

- Users of an EPS for UTRAN/GERAN and E-UTRAN network access into a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

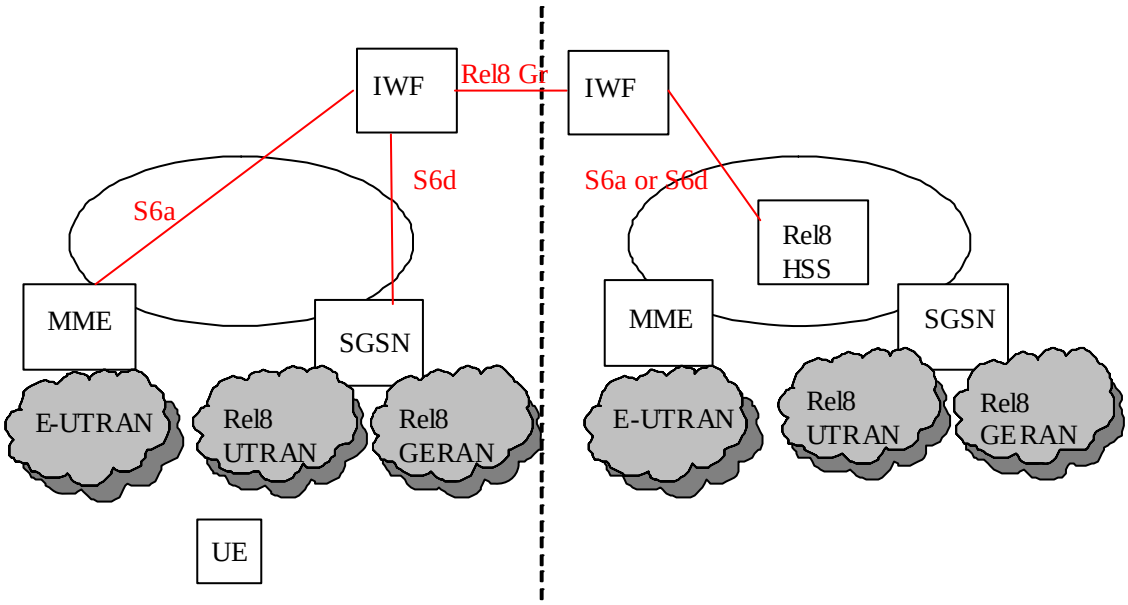


Figure 4.4.2-4 IWF Scenario three network deployment: visited EPS with E-UTRAN and UTRAN/GERAN, home EPS with E-UTRAN and UTRAN/GERAN

The subscription data for SGSN and the subscription data for MME is downloaded to SGSN or MME. SGSN or MME picks up the subscription data for SGSN or MME and discards the subscription data for MME or SGSN.

- Users of a Pre Rel8 UMTS/GPRS/EPS for E-UTRAN only network access into a visited EPS with only E-UTRAN, which is described as below:

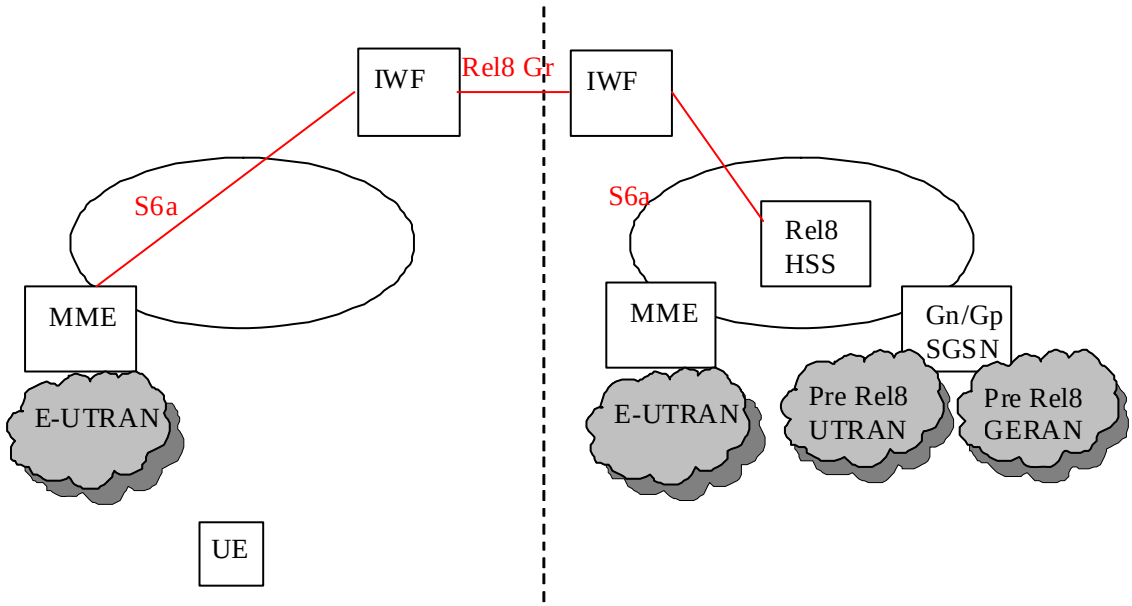


Figure 4.4.2-5 IWF Scenario three network deployment: visited EPS with E-UTRAN only, home ESP with E-UTRAN only and Pre Rel8 UMTS/GPRS

The subscription data for Pre Rel8 Gn/Gp SGSN and the subscription data for MME is downloaded to MME. MME picks up the subscription data for MME and discards the subscription data for Pre Rel8 Gn/Gp SGSN.

NOTE: This IWF scenario can not be used for interworking between two EPS network with only E-UTRAN in which there in no MAP based roaming agreement to be reused.

4.5 Scenario Four: S13/S13' - Gf interworking scenario with one IWF

4.5.1 General Description

This interworking scenario is for S13/S13' interface based on Diameter and Gf interface based on MAP with one IWF in the path.

This IWF scenario can only be an intra PLMN use case for operator to do the partly update of their legacy network.

This interworking scenario is described as below:

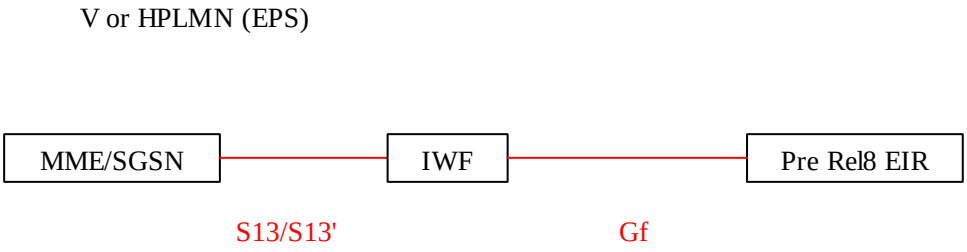


Figure 4.5.1-1 S13/S13' - Gf interworking scenario with one IWF

4.5.2 Network Deployments

This IWF scenario will apply the following network deployment situation:

- ME identity/IMEISV of a user from a Pre Rel8 UMTS/GPRS network can be checked in a visited EPS with E-UTRAN only, which is described as below:

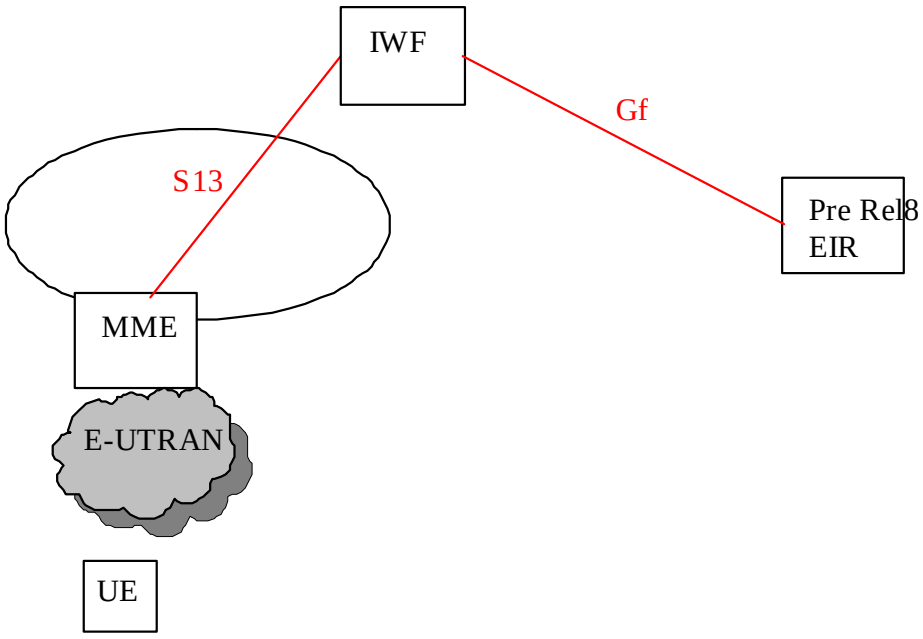


Figure 4.5.2-1 IWF Scenario for network deployment: UE access from EPS with E-UTRAN only

- ME identity/IMEISV of a user from a Pre Rel8 UMTS/GPRS network can be checked in a visited EPS with E-UTRAN and UTRAN/GERAN, which is described as below:

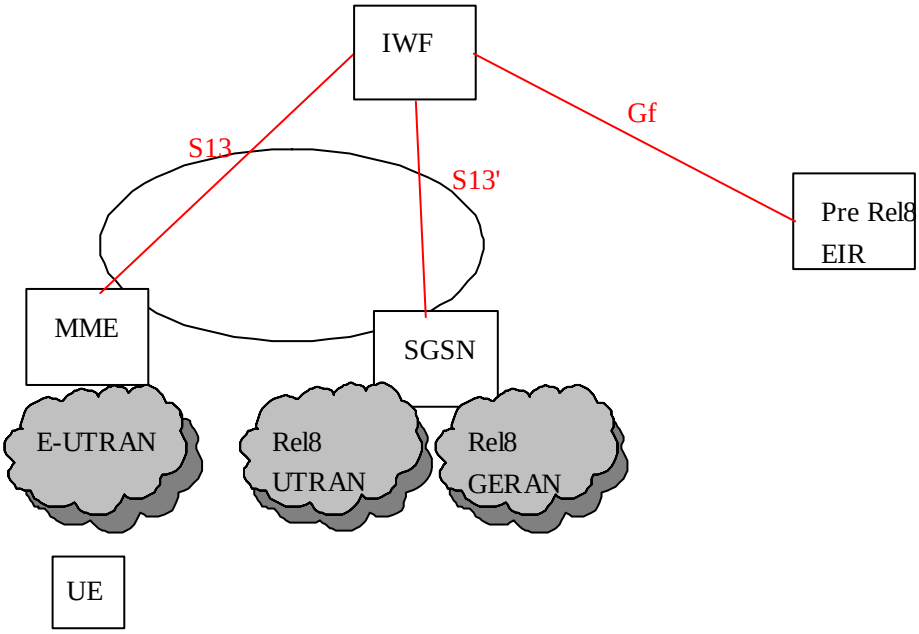


Figure4.5.2-2 IWF Scenario for network deployment: UE access from EPS with E-UTRAN and UTRAN/GERAN

5 General issues

5.1 Message Routing Mechanism

The principles for IWF message routing are:

- For the same user, the messages shall go to and come back through the same route with the same IWF(s) for the duration of a MAP dialog.

- To ensure the correct message routing for the interworking scenarios, the IWFs in the network shall be able to map the SS7 number and the Diameter identity of the MME/SGSN 1-to-1. This may be achieved by static or dynamic configuration.

- To ensure the parallel multiple request messages can get their correct response messages, the IWFs in the network shall be able to map the MAP Dialogue Id and the Diameter Session Id 1-to-1.

The overall message routing mechanism for the scenario is described as below:

1. The MME/SGSN may not be able to identify whether there is an IWF or not on the route to an HSS. The routing of the first message from the MME/SGSN to the IWF/HSS is the same as for a normal Diameter message routing. If the MME/SGSN knows the address/name of the IWF/HSS for a certain user, both the Destination-Realm and Destination-Host AVPs shall be present in the request. Otherwise, only the Destination-Realm AVP shall be present and the command shall be routed to the next Diameter node based on the Diameter routing table in the client.

 When the MME/SGSN receives an answer message from the IWF/HSS, it should store the identity of the IWF/HSS for each IMSI for future reference to be able to send messages for the same IMSI.

2. The IWF shall assign an SS7 number for the Diameter node MME/SGSN and shall assign a Diameter identity for the SS7 node HSS. This may be achieved by static configuration or dynamic assignment when the first signalling exchange occurs between the Diameter/SS7 nodes and the IWF. The IWF shall maintain a mapping table (address mapping table) for the assignment relationship.

When a Diameter message reaches the IWF to set up a new Diameter session, the IWF(s) shall allocate a MAP Dialogue Id for the Diameter session. The IWF(s) shall maintain a mapping table (session mapping table) between the MAP Dialogue Id and the Diameter Session Id.

The IWF shall then process messages as described below:

a. When the IWF receives a Diameter message from a Diameter node, it shall map the Diameter message to a MAP message. It shall obtain a MAP Dialogue Id from the Diameter Session Id in the received message according to the session mapping table. The IWF shall obtain the source/destination SS7 Number from the source/destination Diameter Identity in the received message according to the address mapping table.

b. When the IWF receives an SS7 message from an SS7 node, it shall map the MAP message to a Diameter message. It shall obtain the Diameter Session Id from the MAP Dialogue Id in the received message according to the session mapping table. The IWF shall obtain the source/destination Diameter Identity from the source/destination SS7 Number in the received message according to the address mapping table.

3. When the HSS/HLR receives the first message from IWF/SGSN, the HSS/HLR shall record the SS7 number of the source for future message handling.

5.2 Void

5.3 Security Consideration for IWF

To support the full EPS-AKA security level for the related IWF scenarios, the Pre Rel8 HLR shall be upgraded so that E-UTRAN authentication vector requests from nodes serving E-UTRAN can be identified. The detailed mechanism is described in 3GPP TS 33.401 [2].

6 The Interworking Scenarios

6.1 One IWF scenario

In this scenario, one IWF is located between MME or SGSN or combined MME/SGSN and HSS or one IWF is located between MME and EIR, as illustrated in figure 6.1-1:

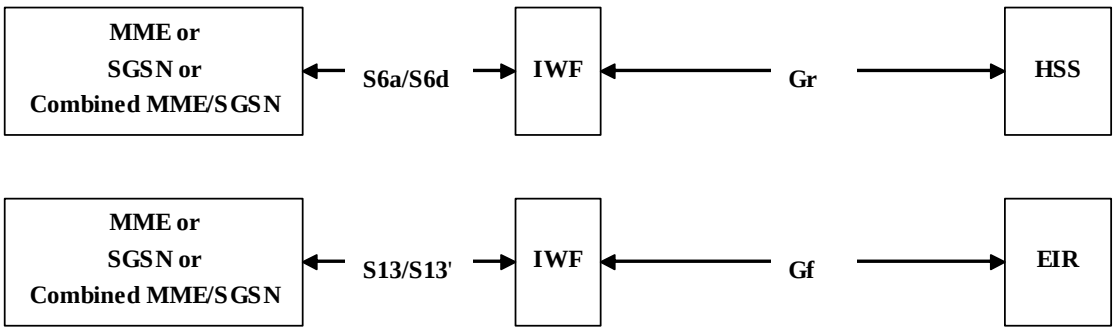


Figure 6.1.-1: One IWF scenarios

The IWF needs not to be aware whether its connection via Gr is to an HSS or to a second IWF (see Two IWF scenario).

6.2 Two IWF scenario

In this scenario, two IWFs are located between MME or SGSN or combined MME/SGSN and HSS, as illustrated in figure 6.2-1:

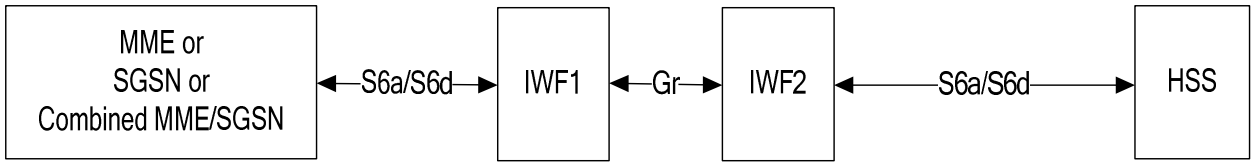


Figure 6.2-1: Two IWFs scenario

The IWF1 is located in the VPLMN. IWF2 is located in the HPLMN. The IWF1 needs not to be aware whether its connection via Gr is to an IWF or to an HSS (see One IWF scenario).

7 The Mapping of the Procedures

7.1 Authentication Information Retrieval

7.1.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.1.1-1:

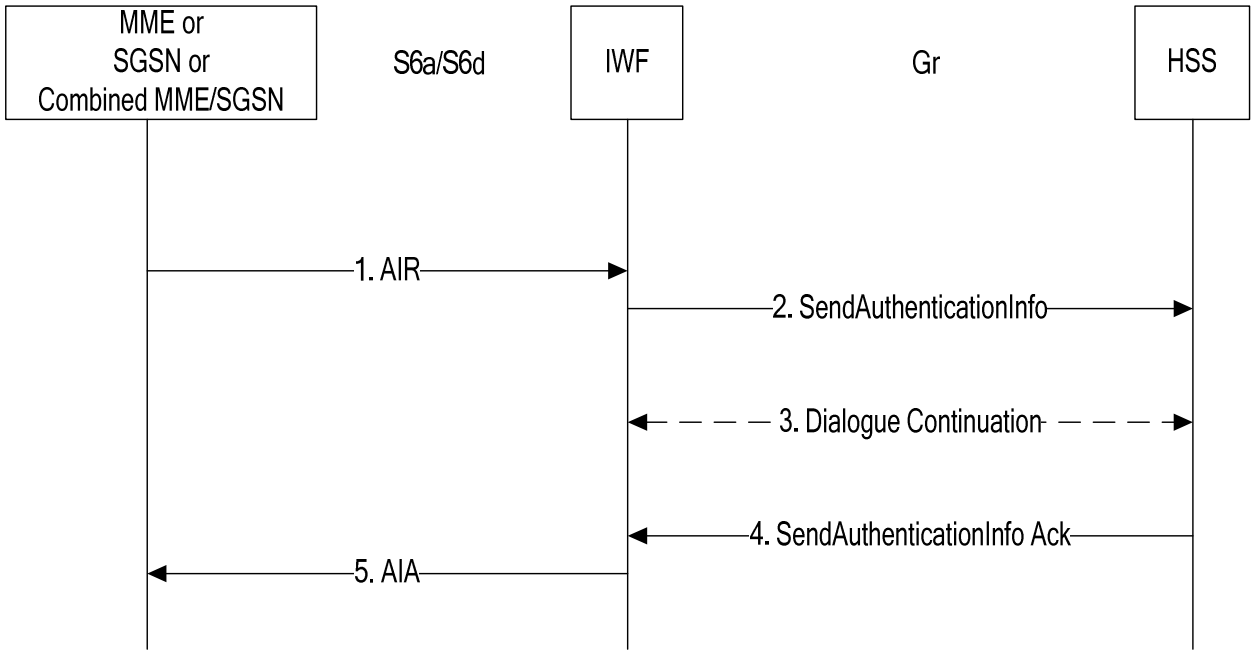


Figure 7.1.1-1: Mapping of Authentication Info Retrieval Procedure for scenario with one IWF

1. The IWF receives an AIR message from the MME, SGSN or combined MME/SGSN.
2. The IWF opens a MAP v3 dialogue towards the HSS by sending SendAuthenticationInfo.
3. The HSS may initiate MAP version fallback and/or send partial results. The IWF performs the version fallback and/or stores the partial results. If EPS-Vectors are requested for immediate use, version fallback is not applicable;
4. The HSS closes the MAP dialogue by sending the (final) SendAuthenticationInfo Ack to the IWF.
5. The IWF uses the information received from the HSS to construct an AIA which is sent to the MME, SGSN, or combined MME/SGSN.

7.1.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.1.2-1:

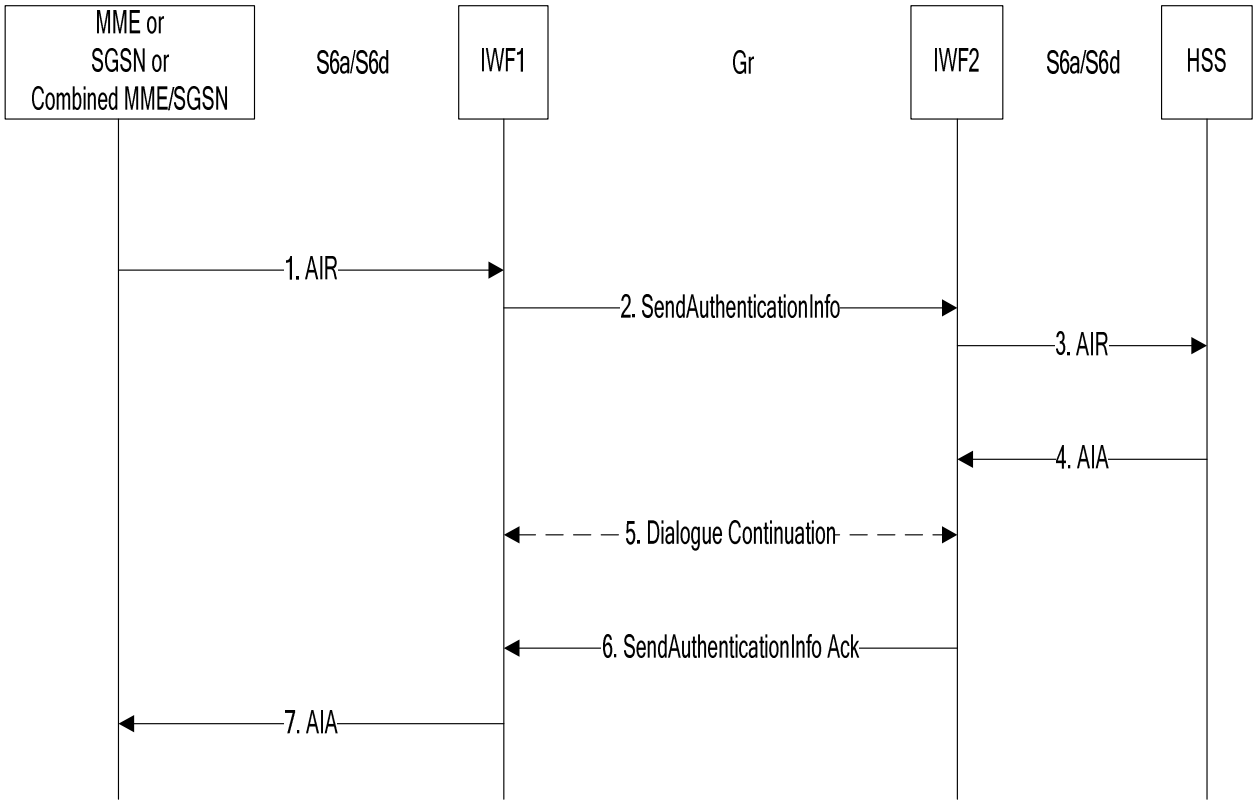


Figure 7.1.2-1: Mapping of Authentication Info Retrieval Procedure for scenario with two IWFs

1. The IWF1 receives an AIR message from the MME, SGSN or combined MME/SGSN.
2. The IWF1 opens a MAP v3 dialogue towards IWF2 by sending SendAuthenticationInfo.
3. The IWF2 constructs an AIR message and sends it to the HSS.
4. The IWF2 receives AIA from the HSS.
5. If segmentation is required, the IWF2 sends partial results to the IWF1 which stores the partial results.
6. The IWF2 closes the MAP dialogue by sending the (final) SendAuthenticationInfo Ack to IWF1.
7. The IWF1 uses the information received from the IWF2 to construct an AIA which is sent to the MME, SGSN, or combined MME/SGSN.

7.2 Update Location

7.2.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.2.1-1:

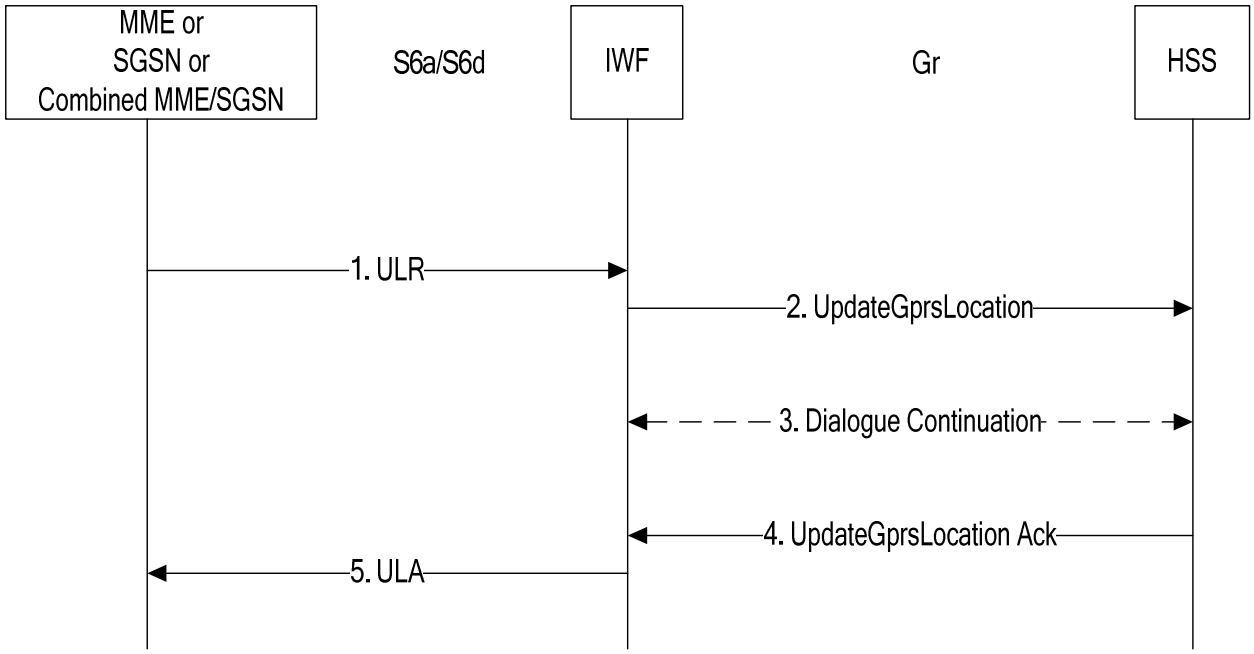


Figure 7.2.1-1: Mapping of Update Location Procedure for scenario with one IWF

1. The IWF receives an ULR message from the MME, SGSN or combined MME/SGSN.
2. The IWF shall open a MAP v3 dialogue towards the HSS by sending UpdateGprsLocation.
3. Depending on "skip subscriber data" indication received in the ULR (bullet 1 aboveand hence sent as per bullet 2 in the UpdateGprsLocation), the HSS may continue the MAP dialogue by sending one or several InsertSubscriberData messages (in acknowledgement mode or in burst mode) to the IWF. The IWF then temporarily stores the received data and sends InsertSubscriberData Ack messages to the HSS.

 Note that the HSS may send InsertSubscriberData messages although a "skip subscriber data" indication was present. In this case InsertSubscriberData messages received from the HSS shall be acknowledged but need not be stored in the IWF.

 When sending InsertSubscriberData Ack messages to the HSS the IWF shall mirror back any services requested by the HSS (within the InsertSubscriberData message) but not supported by the MME or SGSN or combined MME/SGSN (as indicated in 1.ULR). The IWF shall reject a MAP ActivateTraceMode message received from the HSS by returning ActivateTraceMode Error (facilityNotSupported).

 If the IWF received a MAP ActivateTraceMode message from the HSS, the IWF needs to store the received trace data. Based upon support of tracing (as indicated the ULR received in bullet 1 above), the MME/SGSN sends an ActivateTraceMode Result (positive Ack) or Error FacilityNotSupported (negative Ack) to the HSS.
4. The HSS shallclose the MAP dialogue by sending UpdateGprsLocation Ack to the IWF.
5. The IWF shal use the information received from the HSS to construct an ULA which is sent to the MME, SGSN, or combined MME/SGSN.

7.2.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.2.2-1:

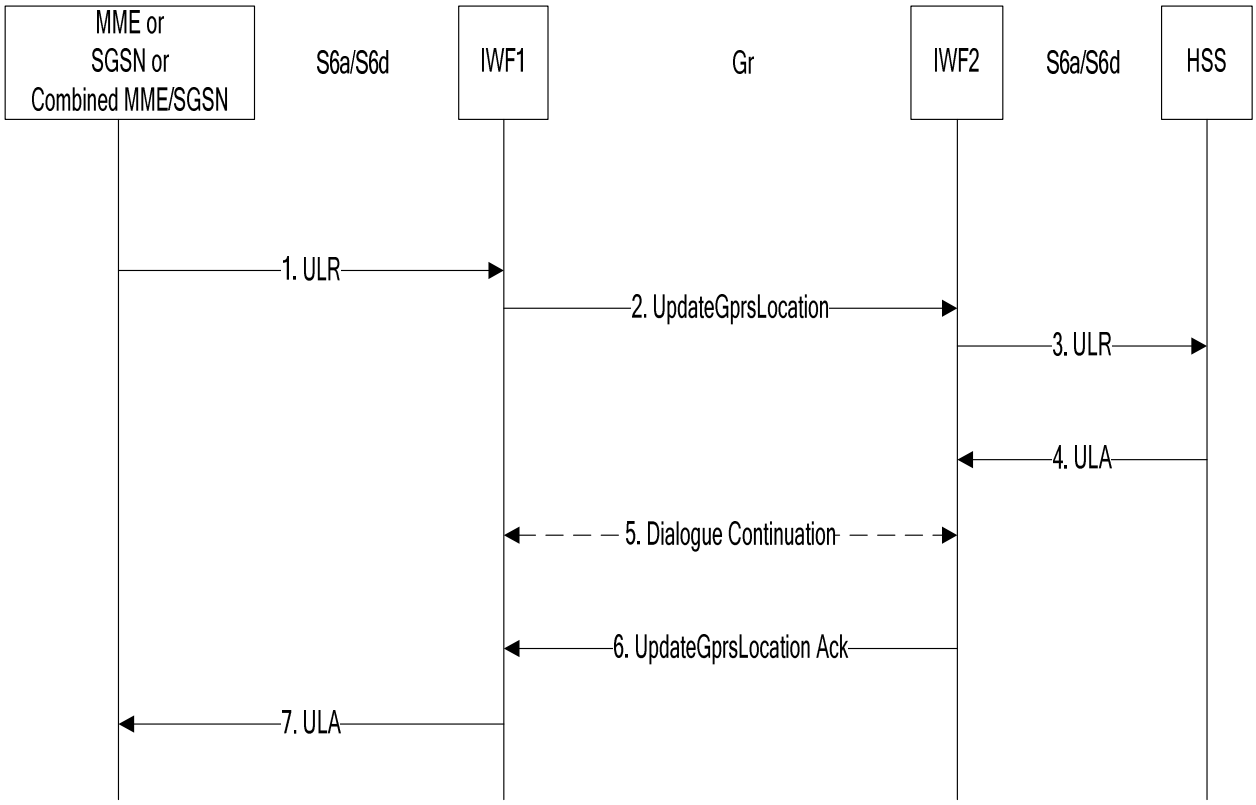


Figure 7.2.2-1: Mapping of Update Location Procedure for scenario with two IWFs

1. The IWF1 receives an ULR message from the MME, SGSN or combined MME/SGSN.
2. The IWF1 shall open a MAP v3 dialogue towards IWF2 by sending UpdateGprsLocation.
3. The IWF2 shall construct a ULR message and shall send it to the HSS.
4. The IWF2 receives ULA from the HSS.
5. If subscriber data is included in the ULA(as per bullet 4), the IWF2 shall send one or several InsertSubscriberData messages (in acknowledgement mode or in burst mode) to the IWF1. IWF1 then temporarily stores the received data and sends InsertSubscriberData Ack messages to the IWF2. If trace data is included in the ULA (bullet 4. above) , the IWF2 sends an ActivateTraceMode message to the IWF1, which sends an ActivateTraceMode Ack message to the IWF2.
6. The IWF2 shall close the MAP dialogue by sending UpdateGprsLocation Ack to IWF1.
7. The IWF1 shall use the information received from the IWF2 to construct an ULA which shall be sent to the MME, SGSN, or combined MME/SGSN.

7.3 Cancel Location

7.3.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.3.1-1:

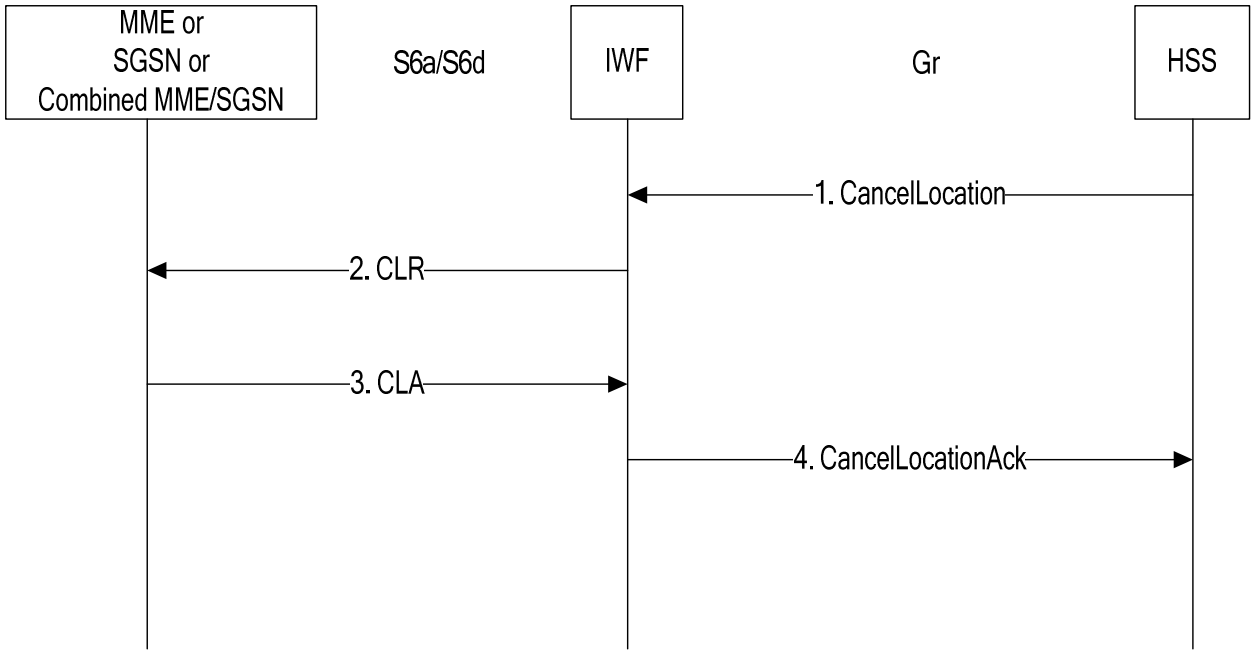


Figure 7.3.1-1: Mapping of Cancel Location Procedure for scenario with one IWF

1. The IWF receives a CancelLocation MAP v3 message from the HSS (the IWF shall reject CancelLocation messages in version <3 and shall initiate version fallback when receiving CancelLocation messages in versions >3; not shown in figure 7.3.1-1).
2. The IWF sends CLR to the MME or SGSN or combined MME/SGSN.
3. The IWF receives CLA.
4. The IWF closes the MAP dialogue with the HSS by sending CancelLocation Ack.

7.3.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.3.2-1:

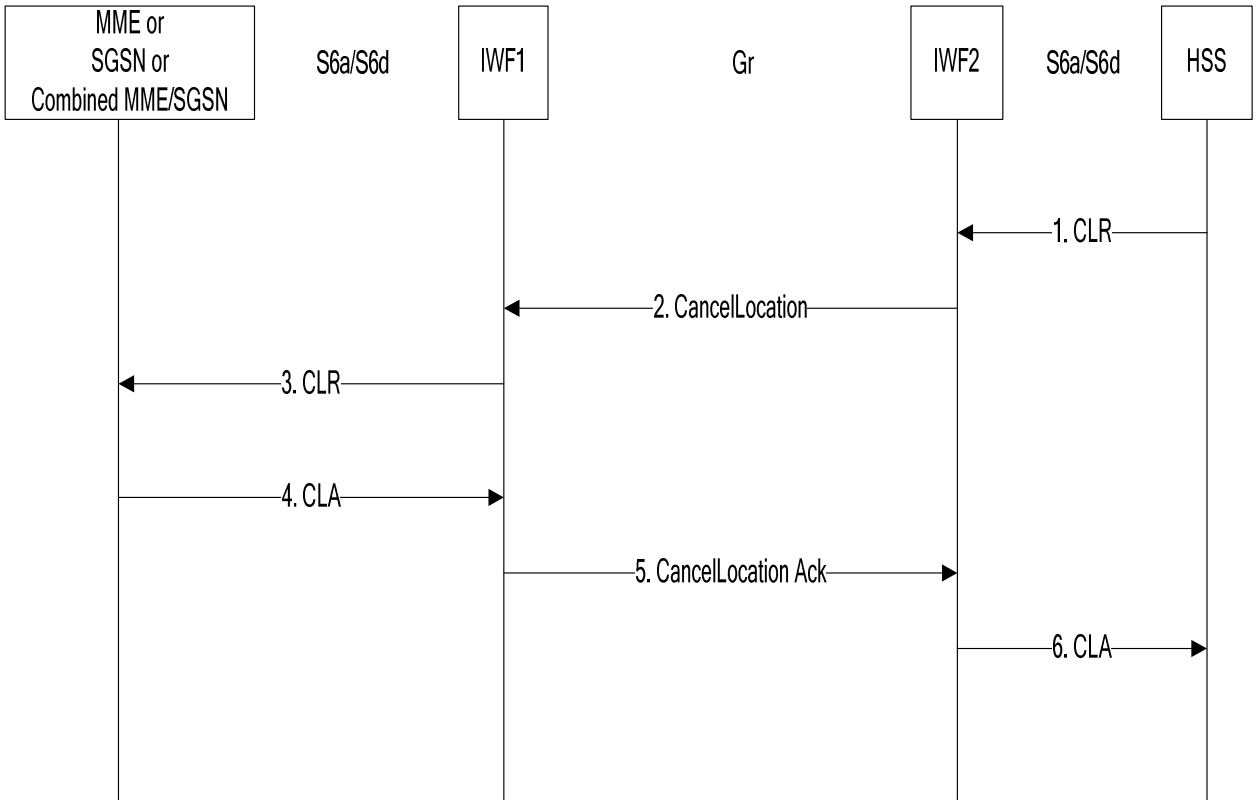


Figure 7.3.2-1: Mapping of Cancel Location Procedure for scenario with two IWFs

1. The IWF2 receives a CLR message from the HSS.
2. The IWF2 opens a MAP v3 dialogue towards IWF1 by sending CancelLocation.
3. The IWF1 constructs a CLR message and sends it to the MME, SGSN, or combined MME/SGSN.
4. The IWF1 receives CLA from the MME, SGSN or combined MME/SGSN.
5. The IWF1 closes the MAP dialogue with the IWF2 by sending CancelLocation Ack.
6. The IWF2 sends CLA to the HSS.

7.4 Purge

7.4.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.4.1-1:

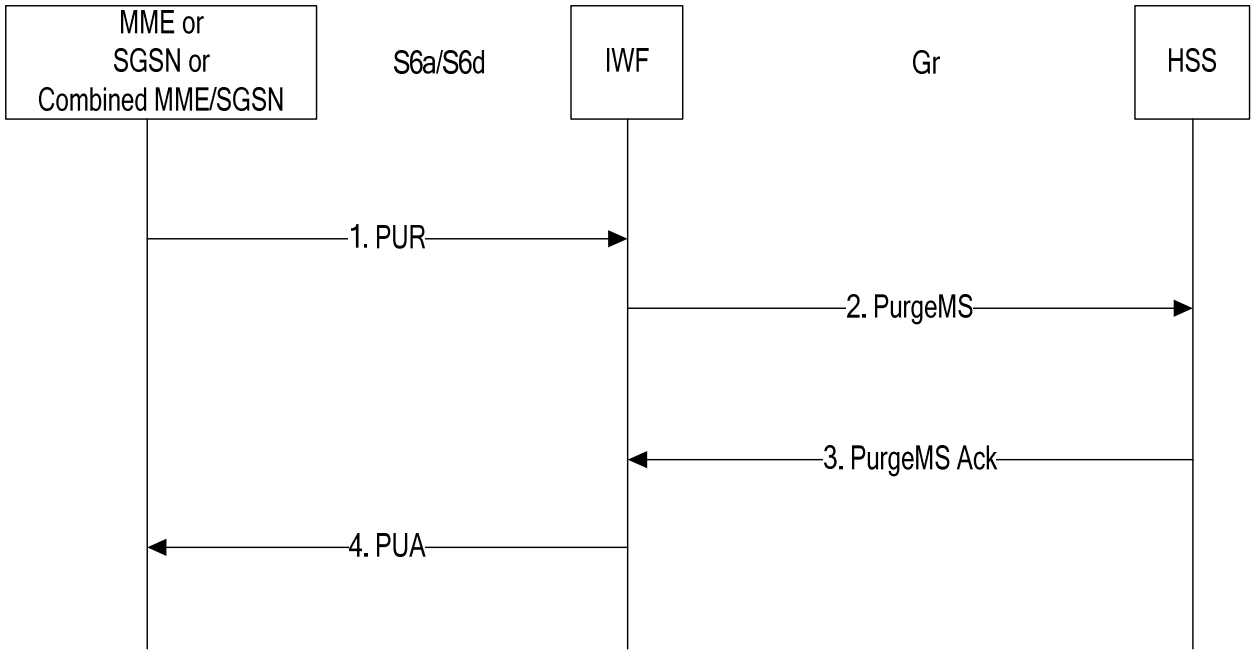


Figure 7.4.1-1: Mapping of Purge Procedure for scenario with one IWF

1. The IWF receives a PUR message from the MME, SGSN, or combined MME/SGSN.
2. The IWF opens a MAP v3 dialogue towards the HSS by sending PurgeMS.
3. The IWF receives PurgeMS Ack from the HSS.
4. The IWF sends PUA to the MME, SGSN, or combined MME/SGSN.

7.4.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.4.2-1:

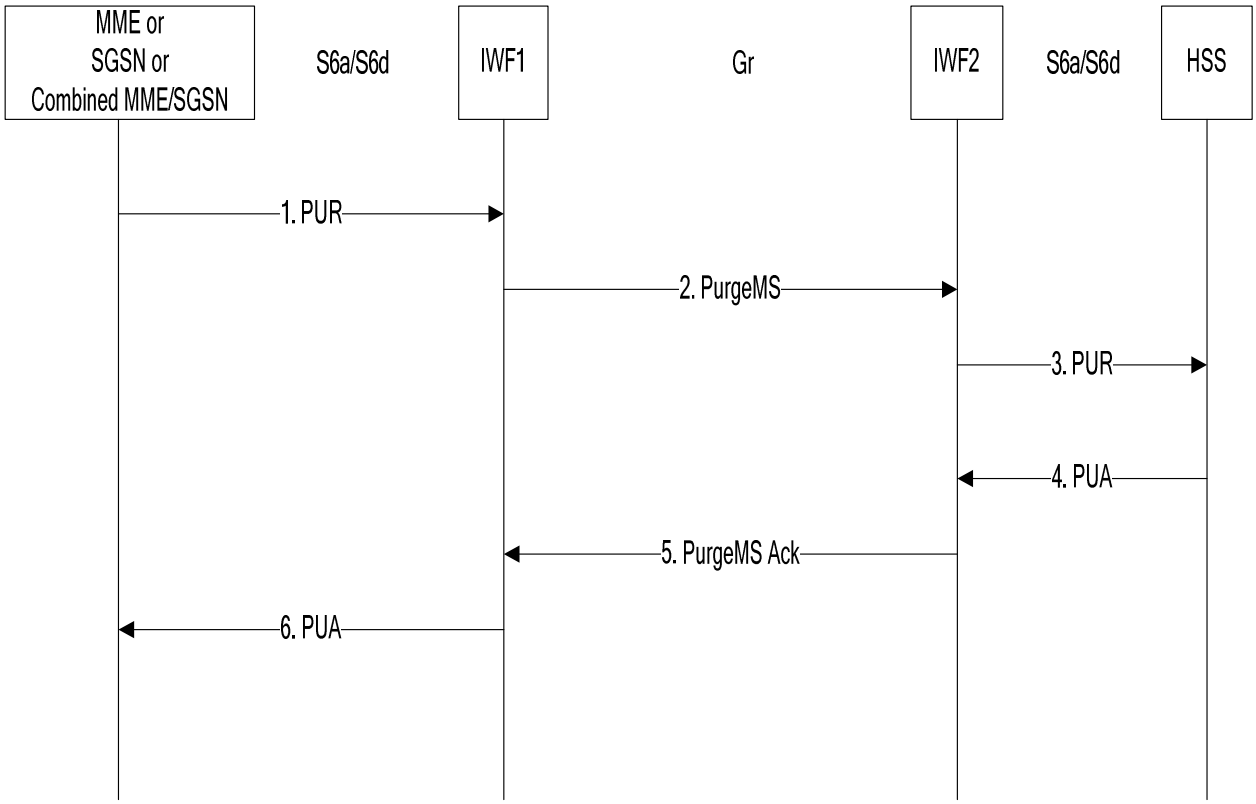


Figure 7.4.2-1: Mapping of Purge Procedure for scenario with two IWFs

1. The IWF1 receives a PUR message from the MME, SGSN, or combined MME/SGSN.
2. The IWF1 opens a MAP v3 dialogue towards IWF2 by sending PurgeMS.
3. The IWF2 constructs a PUR message and sends it to the HSS.
4. The IWF2 receives PUA from the HSS.
5. The IWF2 closes the MAP dialogue with the IWF1 by sending PurgeMS Ack.
6. The IWF1 sends PUA to the MME, SGSN, or combined MME/SGSN.

7.5 Insert Subscriber Data

7.5.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.5.1-1:

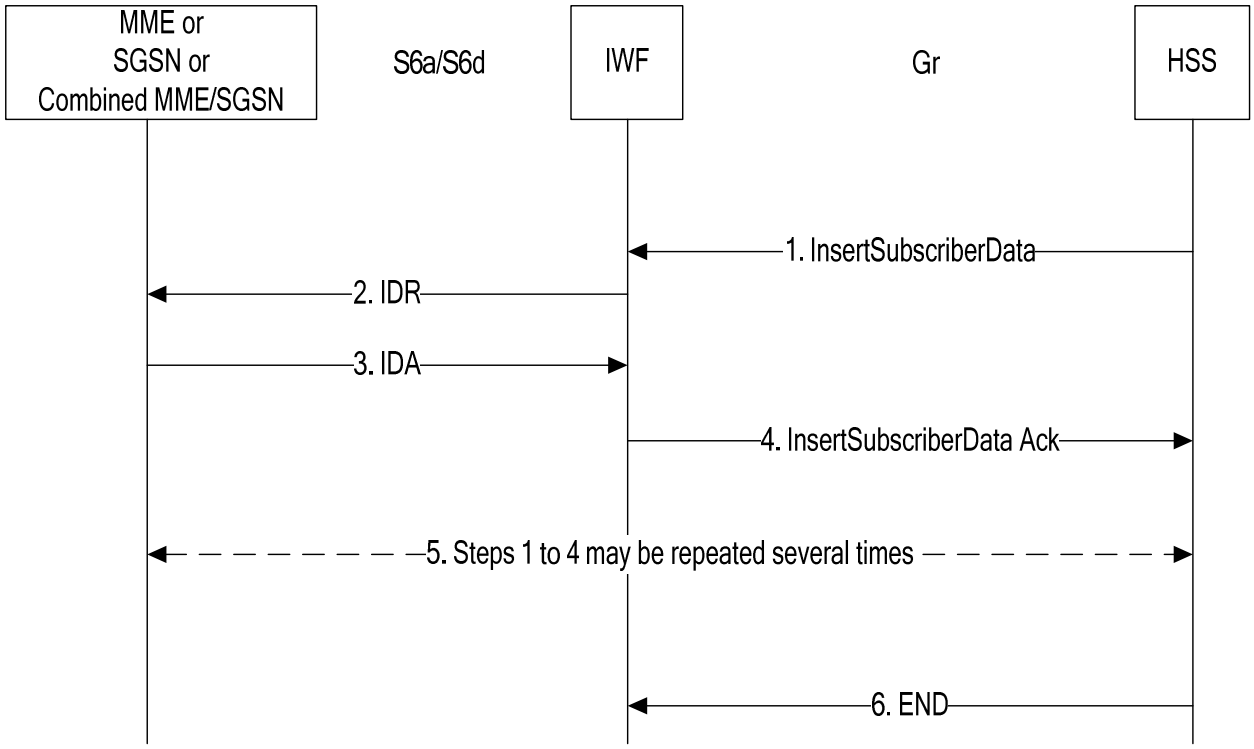


Figure 7.5.1-1: Mapping of Insert Subscriber Data Procedure for scenario with one IWF

1. The IWF receives an (stand alone) InsertSubscriberData message from the HSS.
2. The IWF constructs an IDR message and sends it to the MME, SGSN, or combined MME/SGSN.
3. The IWF receives IDA from the MME, SGSN, or combined MME/SGSN.
4. The IWF sends InsertSubscriberData Ack to the HSS.
5. Steps 1 to 4 may be repeated several times. The repetition may be in burst mode or in acknowledge mode.
6. The HSS closes the MAP dialogue.

7.5.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.5.2-1:

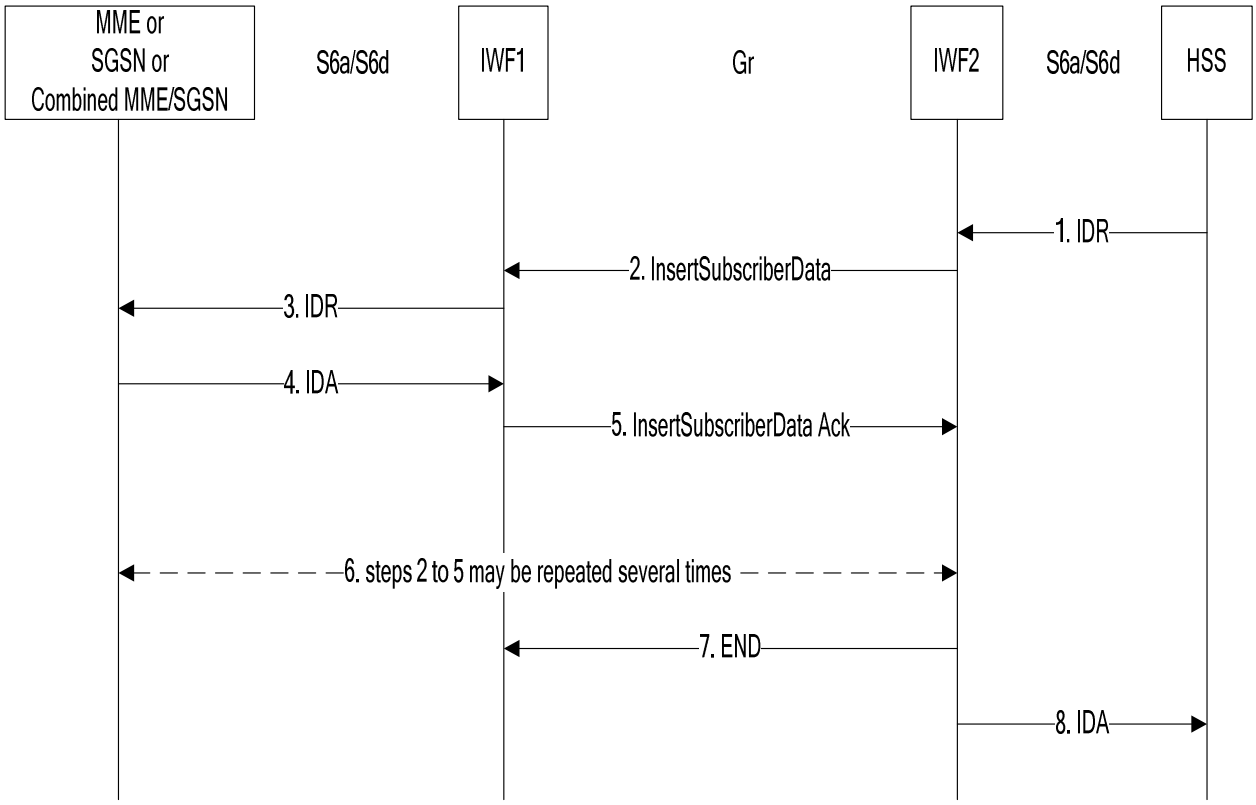


Figure 7.5.2-1: Mapping of Insert Subscriber Data Procedure for scenario with two IWFs

1. The IWF2 receives a IDR message from the HSS.
2. The IWF2 opens a MAP v3 dialogue towards IWF1 by sending InsertSubscriberData. If segmentation of the data (on MAP level) is required the IWF2 temporarily stores the data that could not be sent in this step.
3. The IWF1 constructs a IDR message and sends it to the MME, SGSN, or combined MME/SGSN.
4. The IWF1 receives IDA from the MME, SGSN, or combined MME/SGSN.
5. The IWF1 sends InsertSubscriberData Ack to IWF2.
6. If segmentation is required, steps 2 to 5 are be repeated until all data are sent. Repetition may be in burst mode or in acknowledge mode.
7. IWF2 closes the MAP dialogue with IWF1.
8. IWF2 sends IDA to the HSS.

7.6 Delete Subscriber Data

7.6.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.6.1-1:

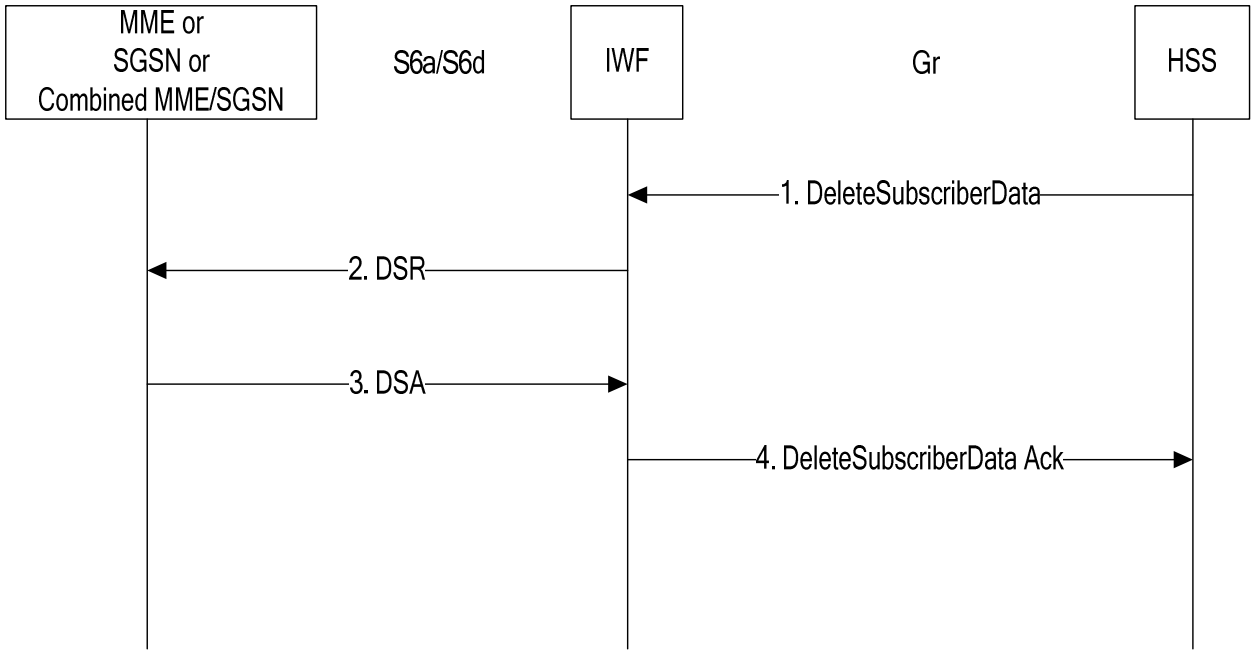


Figure 7.6.1-1: Mapping of Delete Subscriber Data Procedure for scenario with one IWF

1. The IWF receives a DeleteSubscriberData MAP v3 message from the HSS (the IWF shall reject DeleteSubscriberData messages in version <3 and shall initiate version fallback when receiving DeleteSubscriberData messages in versions >3; not shown in figure 7.6.1-1).
2. The IWF sends DSR to the MME or SGSN or combined MME/SGSN.
3. The IWF receives DSA.
4. The IWF closes the MAP dialogue with the HSS by sending DeleteSubscriberData Ack.

7.6.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.6.2-1:

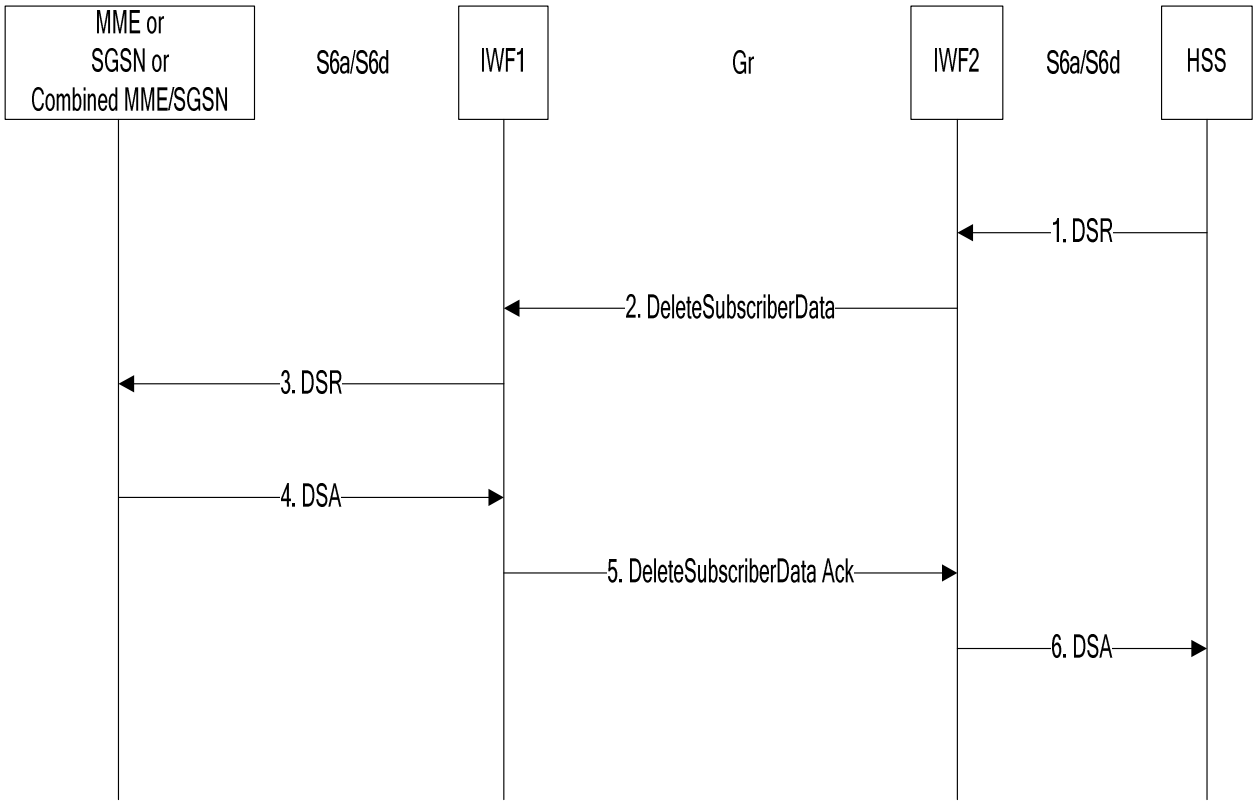


Figure 7.6.2-1: Mapping of Delete Subscriber Data Procedure for scenario with two IWFs

1. The IWF2 receives a DSR message from the HSS.
2. The IWF2 opens a MAP v3 dialogue towards IWF1 by sending DeleteSubscriberData.
3. The IWF1 constructs a DSR message and sends it to the MME, SGSN, or combined MME/SGSN.
4. The IWF1 receives DSA from the MME, SGSN or combined MME/SGSN.
5. The IWF1 closes the MAP dialogue with the IWF2 by sending DeleteSubscriberData Ack.
6. The IWF2 sends DSA to the HSS.

7.7 Reset

7.7.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.7.1-1:

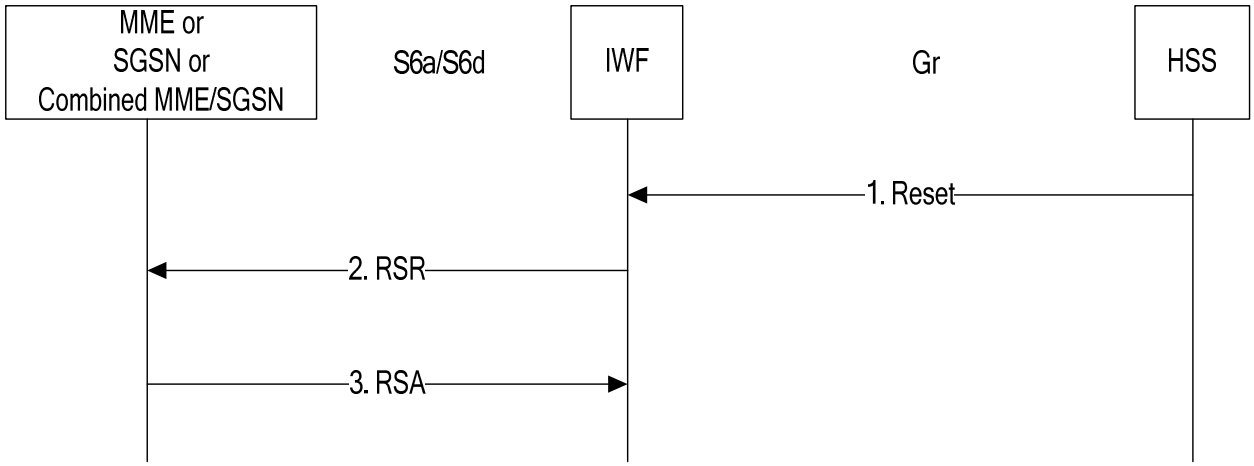


Figure 7.7.1-1: Mapping of Reset Procedure for scenario with one IWF

1. The IWF receives a Reset MAP v1 or v2 message from the HSS.
2. The IWF sends RSR to the MME or SGSN or combined MME/SGSN.
3. The IWF receives RSA.

7.7.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.7.2-1:

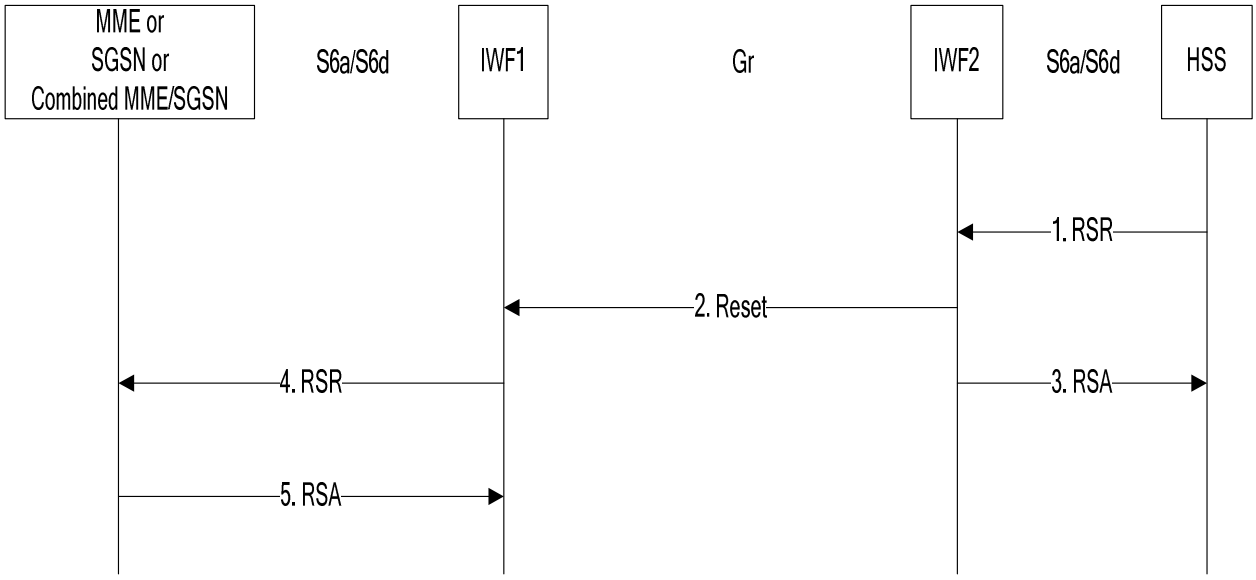


Figure 7.7.2-1: Mapping of Reset Procedure for scenario with two IWFs

1. The IWF2 receives a RSR message from the HSS.
2. The IWF2 opens a MAP v1 or v2 (vendor option) dialogue towards IWF1 by sending Reset.
3. The IWF2 sends RSA to the HSS.
4. The IWF1 constructs a RSR message and sends it to the MME, SGSN, or combined MME/SGSN.
5. The IWF1 receives RSA from the MME, SGSN or combined MME/SGSN.

7.8 Notification

7.8.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.8.1-1:

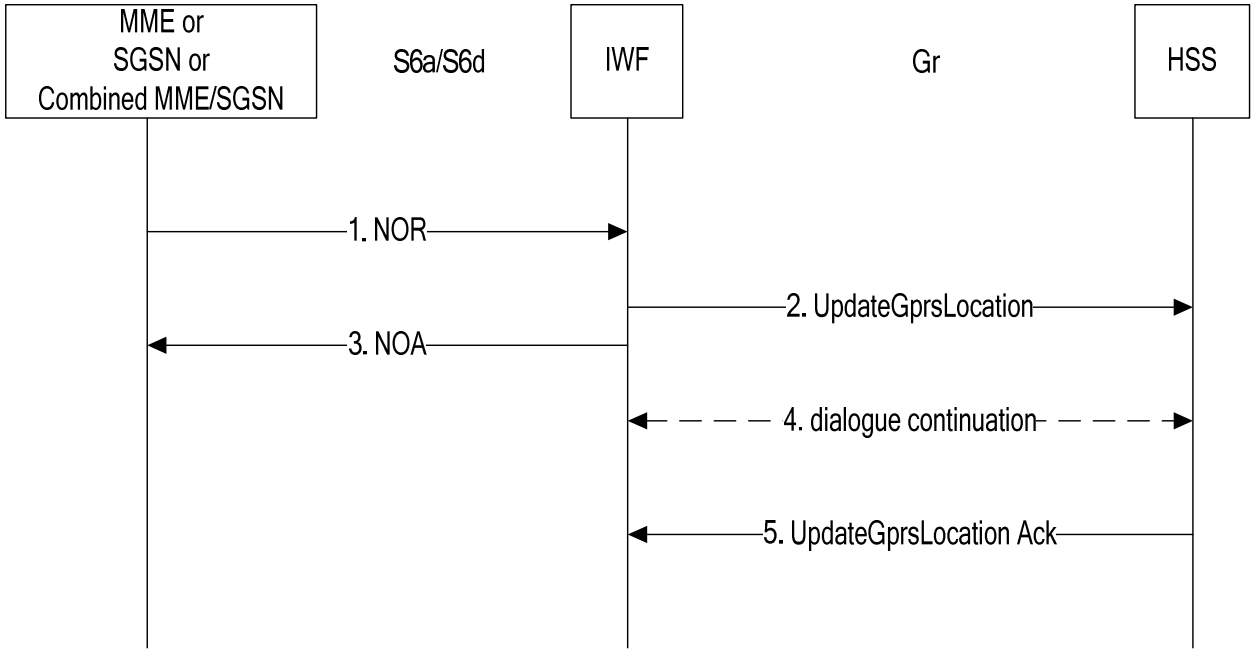


Figure 7.8.1-1: Mapping of Notification Procedure for scenario with one IWF

1. The IWF receives a NOR message from the MME, SGSN, or combined MME/SGSN.
2. The IWF sends UpdateGprsLocation or ReadyForSM to the HSS.
3. The IWF sends NOA to the MME, SGSN, or combined MME/SGSN.
4. The HSS (if it does not support the "skip subscriber data" indication) may continue the MAP dialogue by sending InsertSubscriberData messages which are positively acknowledged and discarded by the IWF.
5. The HSS closes the MAP dialogue by sending UpdateGprsLocation Ack or ReadyForSM Ack.

7.8.2 Two IWFs Scenario

The mapping of procedures for this scenario is shown in figure 7.8.2-1:

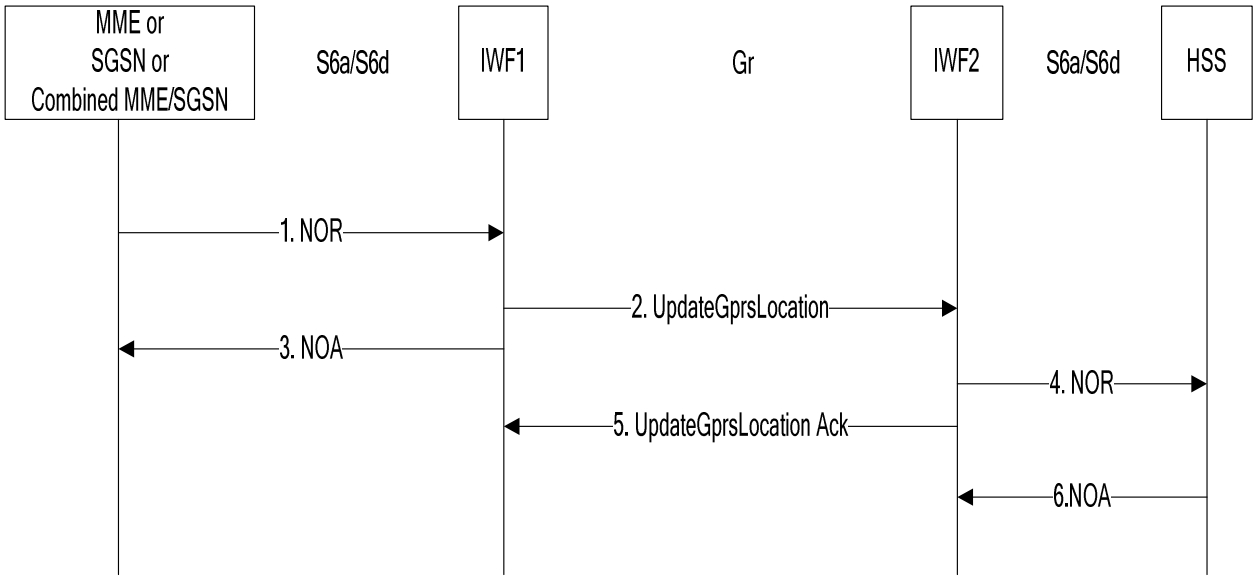


Figure 7.8.2-1: Mapping of Notification Procedure for scenario with two IWFs

1. The IWF1 receives a NOR message from the MME, SGSN, or combined MME/SGSN.
2. The IWF1 sends UpdateGprsLocation or ReadyForSM to the IWF2.
3. The IWF1 sends NOA to the MME, SGSN, or combined MME/SGSN.
4. The IWF2 sends NOR to the HSS.
5. The IWF2 closes the MAP dialogue with IWF1 by sending UpdateGprsLocation Ack or ReadyForSM Ack.
6. The IWF2 receives NOA from the HSS.

7.9 IMEI Check

7.9.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.9.1-1:

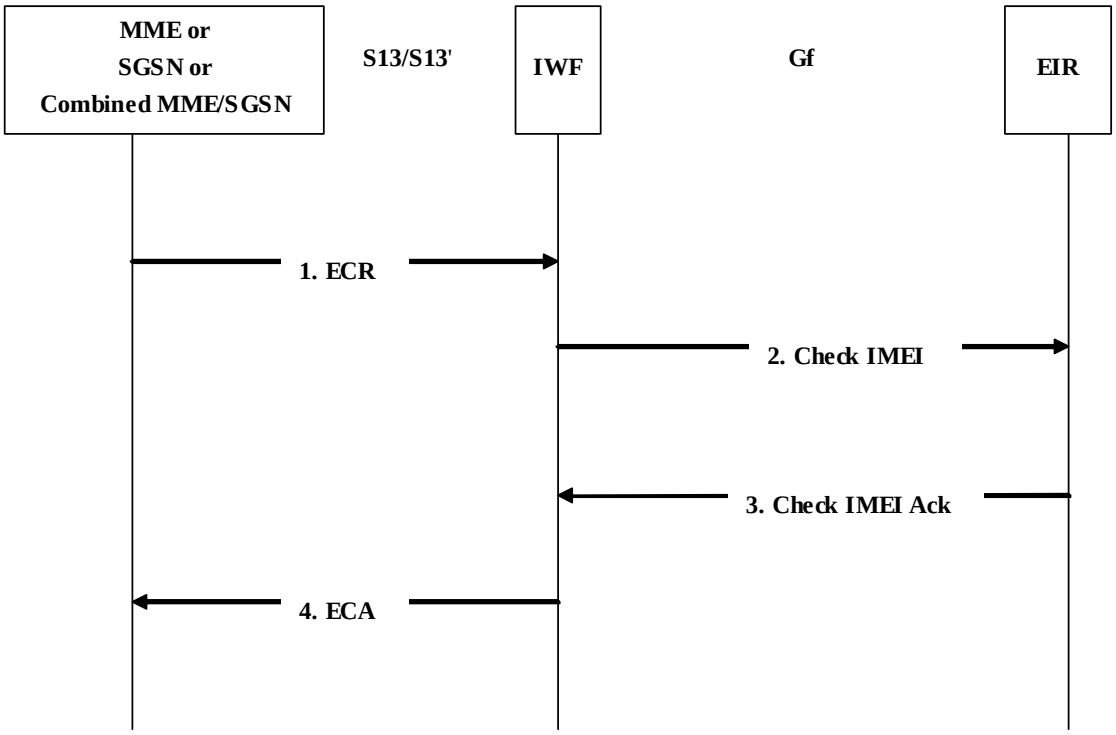


Figure 7.9.1-1: Mapping of IMEI Check Procedure with one IWF

1. The IWF receives an ECR message from the MME/SGSN.
2. The IWF sends Check IMEI to the EIR.
3. The IWF receives Check IMEI Ack from the EIR.
4. The IWF sends ECA to the MME/SGSN.

7.10 Trace Activation

7.10.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.10.1-1:

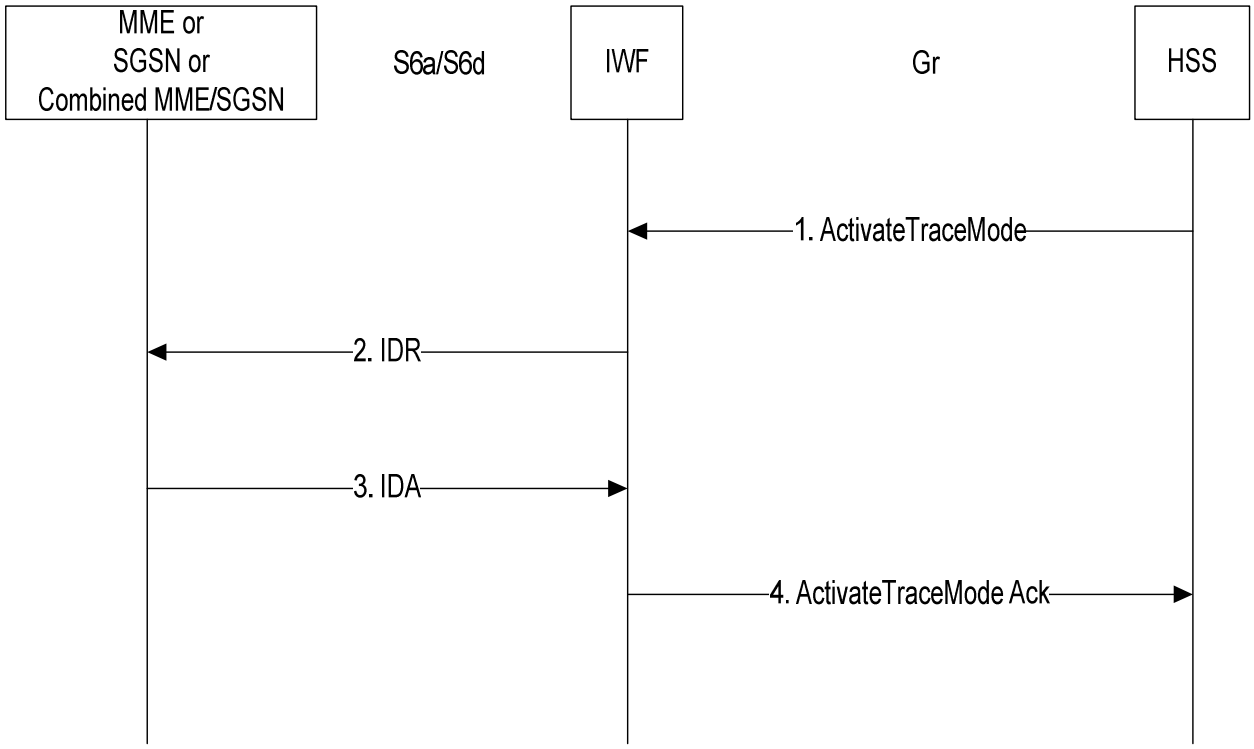


Figure 7.10.1-1: Mapping of Trace Activation Procedure for scenario with one IWF

1. The IWF receives an ActivateTraceMode message from the HSS.
2. The IWF shall construct an IDR message and send it to the MME, SGSN, or combined MME/SGSN.
3. The IWF receives IDA from the MME, SGSN, or combined MME/SGSN.
4. The IWF shall send an ActivateTraceMode Ack to the HSS.

7.10.2 Two IWFs Scenario

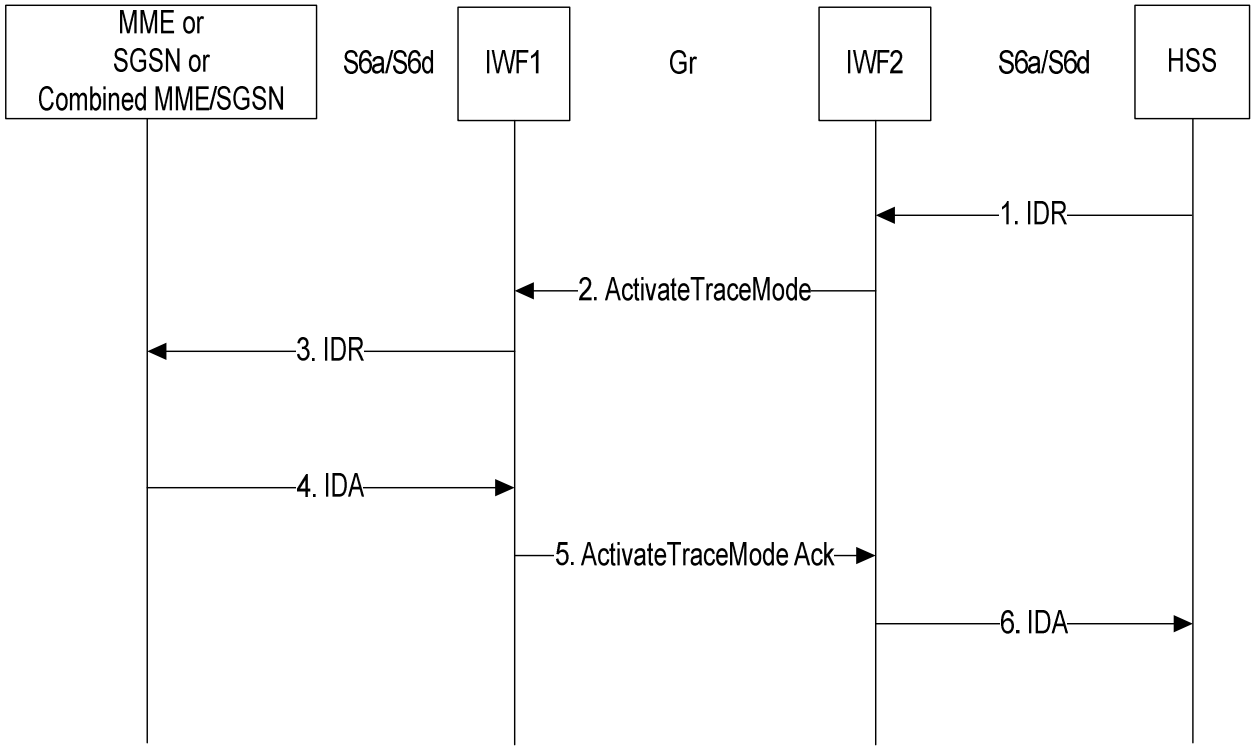


Figure 7.10.2-1: Mapping of Trace Activation Procedure for scenario with two IWFs

1. The IWF2 receives an IDR message from the HSS.
2. If the IWF2 finds that Trace Data is included in the IDR, it shall open a MAP v3 dialogue towards IWF1 by sending ActivateTraceMode.
3. The IWF1 shall construct an IDR message and shall send it to the MME, SGSN, or combined MME/SGSN.
4. The IWF1 receives IDA from the MME, SGSN, or combined MME/SGSN.
5. The IWF1 shall send an ActivateTraceMode Ack to IWF2.
6. IWF2 shall send an IDA to the HSS.

7.11 Trace Deactivation

7.11.1 One IWF Scenario

The mapping of procedures for this scenario is shown in figure 7.11.1-1:

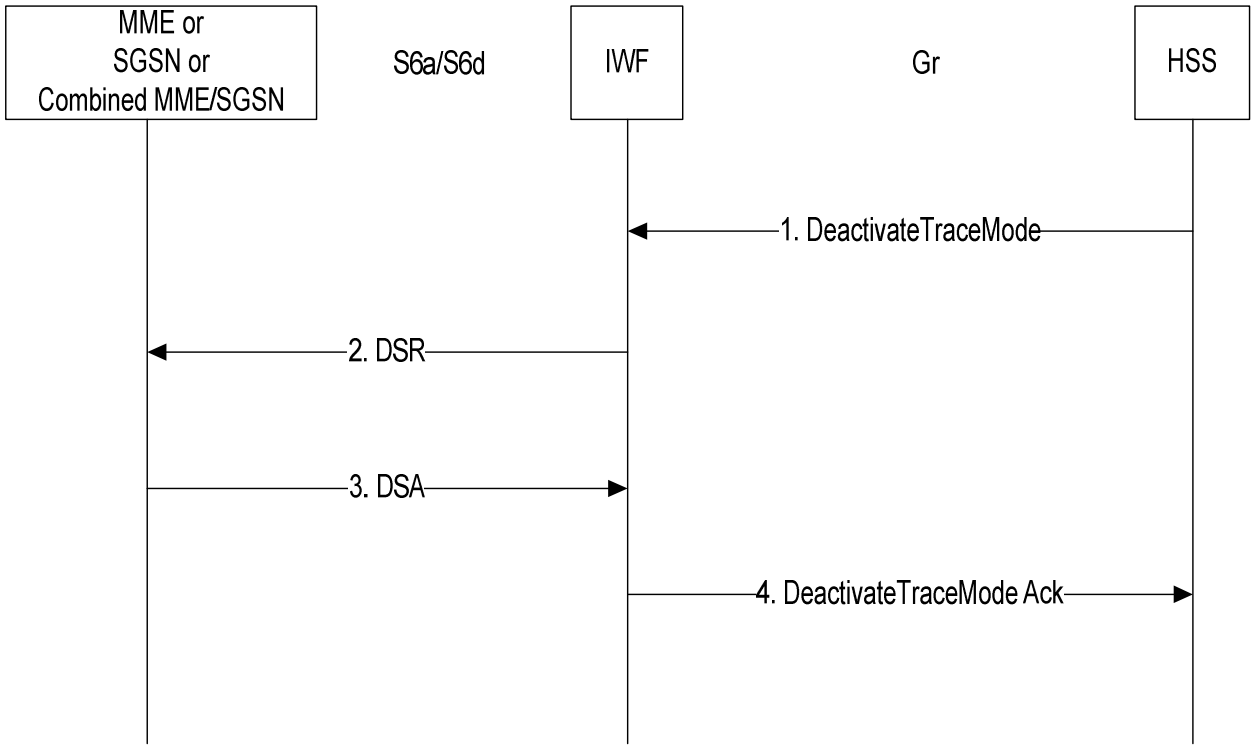


Figure 7.11.1-1: Mapping of Trace Deactivation Procedure for scenario with one IWF

1. The IWF receives a DeactivateTraceMode message from the HSS.
2. The IWF shall construct a DSR message and shall send it to the MME, SGSN, or the combined MME/SGSN.
3. The IWF receives DSA from the MME, SGSN, or combined MME/SGSN.
4. The IWF shall send a DeactivateTraceMode Ack to the HSS.

7.11.2 Two IWFs Scenario

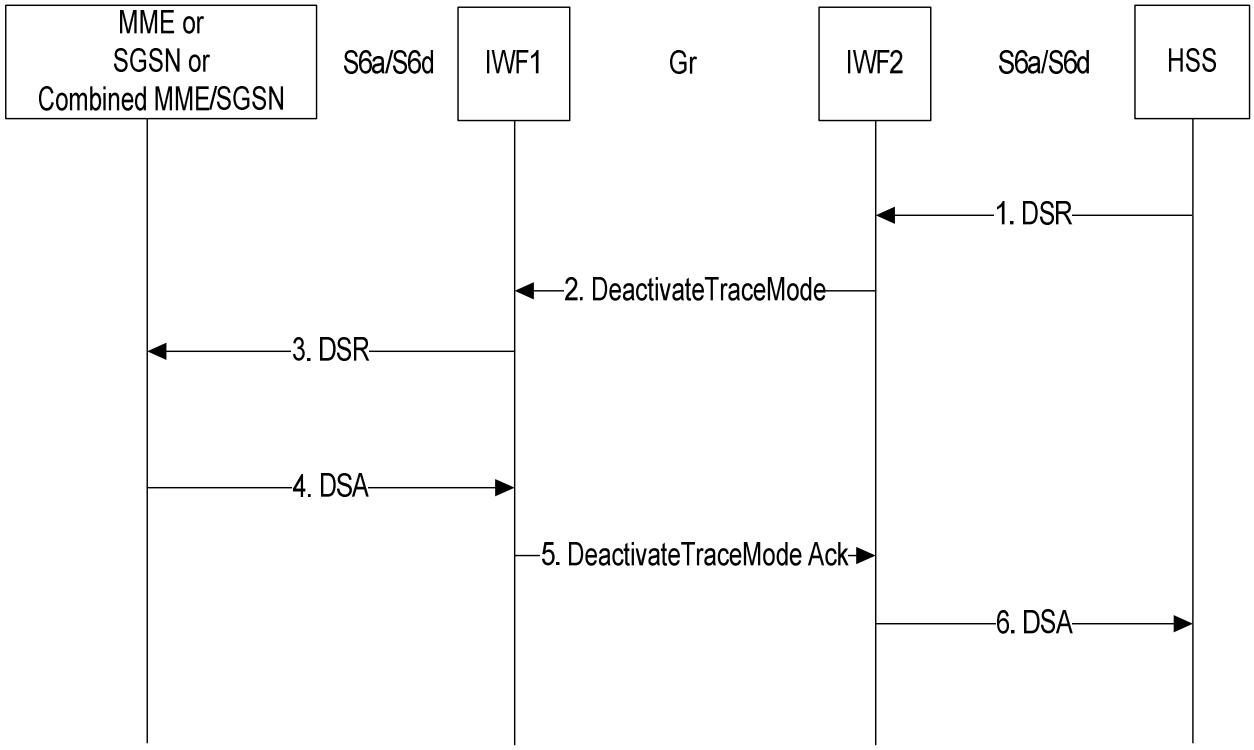


Figure 7.11.2-1: Mapping of Trace Deactivation Procedure for scenario with two IWFs

1. The IWF2 receives a DSR message from the HSS.
2. If the IWF2 finds that a Trace Data Withdrawal indication is included in the DSR, it shall open a MAP v3 dialogue towards IWF1 by sending DeactivateTraceMode.
3. The IWF1 shall construct a DSR message and shall send it to the MME, SGSN, or the combined MME/SGSN.
4. The IWF1 receives DSA from the MME, SGSN, or combined MME/SGSN.
5. The IWF1 shall send a DeactivateTraceMode Ack to the IWF2.
6. The IWF2 shall send a DSA to the HSS.

8 The Mapping of the Parameters

8.1 Mapping of Parameters for the Authentication Info Retrieval Procedure

8.1.1 AIR mapping to SendAuthenticationInfoArg (v3)

When the IWF needs to construct a MAP-SendAuthenticationInfo message as a result of receiving an AIR command (see sections 7.1.1 step 2, and 7.1.2 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of SendAuthenticationInfoArg as described below:

imsi in SendAuthenticationInfoArg shall be populated with the value of the User-Name AVP received within AIR.

If AIR contains a Requested-EUTRAN-Authentication-Info AVP but does not contain a Requested-UTRAN-GERAN-Authentication-Info AVP:

numberOfRequestedVectors in SendAuthenticationInfoArg shall be populated with the value of the Number-Of-Requested-Vectors AVP received within the Requested-EUTRAN-Authentication-Info AVP received within AIR.

If AIR contains a Requested-UTRAN-GERAN-Authentication-Info AVP but does not contain a Requested-EUTRAN-Authentication-Info AVP:

numberOfRequestedVectors in SendAuthenticationInfoArg shall be populated with the value of the Number-Of-Requested-Vectors AVP received within the Requested-UTRAN-GERAN-Authentication-Info AVP received within AIR.

If AIR contains a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP, and the Immediate-Response-Preferred AVP is present within the Requested-EUTRAN-Authentication-Info AVP:

numberOfRequestedVectors in SendAuthenticationInfoArg shall be populated with the value of the Number-Of-Requested-Vectors AVP received within the Requested-EUTRAN-Authentication-Info AVP received within AIR.

If AIR contains a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP, and the Immediate-Response-Preferred AVP is not present within the Requested-EUTRAN-Authentication-Info AVP:

numberOfRequestedVectors in SendAuthenticationInfoArg shall be populated with the value of the Number-Of-Requested-Vectors AVP received within the Requested-UTRAN-GERAN-Authentication-Info AVP received within AIR.

segmentationProhibited shall be absent in SentAuthenticationInfoArg.

If AIR contains a Requested-EUTRAN-Authentication-Info AVP but does not contain a Requested-UTRAN-GERAN-Authentication-Info AVP:

immediateResponsePreferred in SendAuthenticationInfoArg shall be present if and only if the Immediate-Response-Preferred AVP is present within the Requested-EUTRAN-Authentication-Info AVP within AIR.

If AIR contains a Requested-UTRAN-GERAN-Authentication-Info AVP but does not contain a Requested-EUTRAN-Authentication-Info AVP:

immediateResponsePreferred in SendAuthenticationInfoArg shall be present if and only if the Immediate-Response-Preferred AVP is present within the Requested-UTRAN-GERAN-Authentication-Info AVP within AIR.

If AIR contains a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP:

immediateResponsePreferred in SendAuthenticationInfoArg shall be present if and only if the Immediate-Response-Preferred AVP is present within the Requested-UTRAN-GERAN-Authentication-Info AVP or within the Requested-EUTRAN-Authentication-Info AVP within AIR.

re-synchronisationInfo in SendAuthenticationInfoArg shall be present if and only if a Re-synchronization-Info AVP is present wihin the Requested-EUTRAN-Authentication-Info AVP or within the Requested-UTRAN-GERAN-Authentication-Info AVP within AIR.

extensionContainer in SendAuthenticationInfoArg shall be absent.

requestingNodeType in SendAuthenticationInfoArg shall be present and shall be populated with the value
"mme" if a Requested-EUTRAN-Authentication-Info AVP and no Requested-UTRAN-GERAN-Authentication-Info AVP was present within AIR;
"sgsn" if a Requested-UTRAN-GERAN-Authenticatio-Info AVP and no Requested EUTRAN-Authentication-Info AVP was present within AIR;
. "mme-sgsn" if both a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP were present within AIR .

requestingPLMN-Id in SendAuthenticationInfoArg shall be present and shall be populated with the value received within the Visited-PLMN-ID AVP within AIR.

numberOfRequestedAdditional-Vectors in SendAuthenticationInfoArg shall be present if and only if both a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP are present within AIR. If present, the parameter shall be populated with the value received in the Number-Of-Requested-

Vectors AVP within the Requested-EUTRAN-Authentication-Info (if the Immediate-Response-Preferred AVP is absent within Requested-EUTRAN-Authentication-Info AVP within AIR) or with the value received in the Number-Of-Requested-Vectors AVP within the Requested-UTRAN-GERAN-Authentication-Info AVP (otherwise).

additionalVectorsAreForEPS shall be present in SendAuthenticationInfoArg if and only if a Requested-EUTRAN-Authentication-Info AVP and a Requested-UTRAN-GERAN-Authentication-Info AVP are present within AIR and the Immediate-Response-Preferred AVP is absent in the Requested-EUTRAN-Authentication-Info AVP.

8.1.2 AIR mapping to SendAuthenticationInfoArg (v2)

When the IWF needs to construct a MAP-SendAuthenticationInfo message in MAP AC version 2 as a result of MAP version negotiation (see sections 7.1.1 step 3), the IWF shall open a MAP dialogue in application context version 2 and populate sub-parameters of SendAuthenticationInfoArg as described below:

imsi in SendAuthenticationInfoArg shall be populated with the value of the User-Name AVP received within AIR.

8.1.3 AIR mapping to SendParametersArg (v1)

When the IWF needs to construct a MAP-SendParameters message in MAP AC version 1 as a result of MAP version negotiation (see section 7.1.1 step 3), the IWF shall open a MAP dialogue in application context version 1 and populate sub-parameters of SendParametersArg as described below:

subscriberId in SendParametersArg shall take the imsi alternative; imsi shall be populated with the value of the User-Name AVP received within AIR.

requestedParameterList in SendParametersArg shall contain one RequestParameter which contains the value of "requestAuthenticationSet".

8.1.4 SendAuthenticationInfoRes / Error (v3) mapping to AIA

When the IWF needs to construct an AIA command as a result of receiving a SendAuthenticationInfo Ack/Error message in MAP version 3 (see sections 7.1.1 step 5, and 7.1.2 step 7), the IWF shall populate AVPs of AIA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if a SendAuthenticationInfoRes parameter was received in a TCAP ResultLast component;
- DIAMETER_ERROR_USER_UNKNOWN if an error of unknownSubscriber without a diagnostic parameter or with a diagnostic parameter of imsiUnknown was received;
- DIAMETER_ERROR_UNKNOWN_SUBSCRIPTION if an error unknownSubscriber with a diagnostic parameter of gprs-eps-SubscriptionUnknown was received;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Supported-Features AVP shall be absent.

Authentication-Info AVP shall be present if authenticationSetList or eps-AuthenticationSetList is present in the received SendAuthenticationInfoRes. If present, the AVP shall contain EPS-Vector AVPs and/or either UTRAN-Vector AVPs or GERAN-Vector AVPs as mapped from received EPC-AVs and/or either AuthenticationQuintuplets or AuthenticationTriplets respectively.

8.1.5 SendAuthenticationInfoRes / Error (v2) mapping to AIA

When the IWF needs to construct an AIA command as a result of receiving a SendAuthenticationInfo Ack/Error message in MAP version 2 (see sections 7.1.1 step 5), the IWF shall populate AVPs of AIA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if aSendAuthenticationInfoRes parameter was received in a TCAP ResultLast component;
- DIAMETER_ERROR_USER_UNKNOWN if an error of unknownSubscriber without a diagnostic parameter or with a diagnostic parameter of imsiUnknown was received;
- DIAMETER_ERROR_UNKNOWN_SUBSCRIPTION if an error unknownSubscriber with a diagnostic parameter of gprsSubscriptionUnknown was received;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Supported-Features AVP shall be absent.

Authentication-Info AVP shall be present if authenticationSetList is present in the received SendAuthenticationInfoRes. If present, the AVP shall contain GERAN-Vector AVPs as mapped from received AuthenticationTriplets.

8.1.6 SendParameterList / Error (v1) mapping to AIA

When the IWF needs to construct an AIA command as a result of receiving a SendParameters Ack/Error message in MAP version 1 (see sections 7.1.1 step 5), the IWF shall populate AVPs of AIA as described below:

Result-Code / Experimental-Result AVP shall be set to:

DIAMETER_SUCCESS if a SentParameterList parameter was received in a TCAP ResultLast component;

DIAMETER_ERROR_USER_UNKNOWN if an error of unknownSubscriber was received;

an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Supported-Features AVP shall be absent.

Authentication-Info AVP shall be present if sentParameterList is present in the received TCAP ResultLast component. If present, the AVP shall contain GERAN-Vector AVPs as mapped from received AuthenticationTriplets.

8.1.7 SendAuthenticationInfoArg (v3) mapping to AIR

When the IWF needs to construct an AIR command as a result of receiving a SendAuthenticationInfo message in MAP version 3 (see sections 7.1.2 step 3), the IWF shall populate AVPs of AIR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of SendAuthenticationInfoArg.

Supported-Features AVP shall be absent.

Requested-EUTRAN-Authentication-Info AVP shall be present if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme" or "mme-sgsn".

Number-Of-Requested-Vectors AVP within Requested-EUTRAN-Authentication-Info AVP (if present) shall be populated with

a) the value received within the numberOfRequestedVectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme";

b) the value received within the numberOfRequestedVectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and the additionalVectorsAreForEPS parameter is absent from SendAuthenticationInfoArg;

c) the value received within the numberOfRequestedAdditional-Vectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and the additionalVectorsAreForEPS parameter is present within SendAuthenticationInfoArg.

Immediate-Response-Preferred AVP within Requested-EUTRAN-Authentication-Info AVP (if present) shall be present if:

a) requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme" and immediateResponsePreferred parameter is present in SendAuthenticationInfoArg, or

b) requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and additionalVectorsAreForEPS parameter is absent from SendAuthenticationInfoArg and immediateResponsePreferred is present within SendAuthenticationInfoArg.

Re-synchronization-Info AVP within Requested-EUTRAN-Authentication-Info AVP (if present) shall be populated with the value received in the re-synchronizationInfo parameter within SendAuthenticationInfoArg.

Requested-UTRAN-GERAN-Authentication-Info AVP shall be present if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "sgsn" or "mme-sgsn".

Number-Of-Requested-Vectors AVP within Requested-UTRAN-GERAN-Authentication-Info AVP (if present) shall be populated with:

a) the value received within the numberOfRequestedVectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "sgsn";

b) the value received within the numberOfRequestedVectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and the additionalVectorsAreForEPS parameter is present within SendAuthenticationInfoArg;

c) the value received within the numberOfRequestedAdditional-Vectors parameter of SendAuthenticationInfoArg if requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and the additionalVectorsAreForEPS parameter is absent from SendAuthenticationInfoArg.

Immediate-Response-Preferred AVP within Requested-UTRAN-GERAN-Authentication-Info AVP (if present) shall be present if

a) requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "sgsn" and immediateResponsePreferred parameter is present in SendAuthenticationInfoArg, or

b) requestingNodeType parameter within SendAuthenticationInfoArg takes the value of "mme-sgsn" and additionalVectorsAreForEPS parameter is present from SendAuthenticationInfoArg and immediateResponsePreferred is present within SendAuthenticationInfoArg.

Re-synchronization-Info AVP within Requested-EUTRAN-Authentication-Info AVP (if present) shall be populated with the value received in the re-synchronizationInfo parameter within SendAuthenticationInfoArg.

Visited-PLMN-Id AVP shall be populated with the value of the requestingPLMN-Id parameter received within SendAuthenticationInfoArg.

RequestingNodeType AVP shall be populated with the value of the requestingNodeType parameter received within SendAuthenticationInfoArg.

8.1.8 AIA mapping to SendAuthenticationInfoRes/Error (v3)

When the IWF needs to construct a MAP SendAuthenticationInfo Ack message (v3) as a result of receiving an AIA command (see sections 7.1.2 steps 5 and 6), the IWF shall construct partial result messages (if segmentation is required) and a final result message or an error message (if the Result-Code AVP within AIA takes a value different from "success"). Sub-parameters of SendAuthenticationInfoRes shall be populated as described below:

authenticationSetList within SendAuthenticationInfoRes shall be present if UTRAN-Vector AVP or GERAN-Vector AVP is present in Authentication-Info AVP within AIA. If so the parameter shall be populated with the value received within the UTRAN-Vector AVP or GERAN-Vector AVP (whichever is present).

eps-AuthenticationSetList within SendAuthenticationInfoRes shall be present if EPS-Vector AVP is present in Authentication-Info AVP within AIA. If so the parameter shall be populated with the values received within the EPS-Vector AVP.

An error of **unknownSubscriber** with unknownSubscriberParam containing a unknownSubscriberDiagnostic of "imsiUnknown" shall be sent if the received AIA command contains an Experimental-Result AVP with a value of "User Unknown".

An error of **unknownSubscriber** with unknownSubscriberParam containing a unknownSubscriberDiagnostic of "gprs-epsSubscriptionUnknown" shall be sent if the received AIA command contains an Experimental-Result AVP with a value of "Unknown EPS Subscription".

Other values within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.2 Mapping of Parameters for the Update Location Procedure

8.2.1 ULR mapping to UpdateGprsLocationArg

When the IWF needs to construct a MAP-UpdateGprsLocation message as a result of receiving an ULR command (see sections 7.2.1 step 2, and 7.2.2 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of UpdateGprsLocationArg as described below:

imsi in UpdateGprsLocationArg shall be populated with the value of the User-Name AVP received within ULR.

sgsn-Number in UpdateGprsLocationArg shall be populated with the value of the SGSN.Number AVP if present within ULR, otherwise it shall be populated with a value locally assigned to the IWF and consistent with SS7 routing principles.

sgsn-Address in UpdateGprsLocationArg shall be populated with the IP-address of the source node sending the ULR command.

extensionContainer in UpdateGprsLocationArg shall be absent.

sgsn-Capability in UpdateGprsLocationArg shall be populated as follows:

- solsaSupportIndicator shall be absent;
- extensionContainer shall be absent;
- superChargerSupportedInServingNetworkEntity shall be absent;
- gprsEnhancementSupportIndicator shall be present;
- supportedCamelPhases shall be absent or shall indicate no support of any CAMEL phase;
- supportedLCS-CapabilitySet shall be absent or shall indicate no support of any LCS capability set;
- offeredCamel4CSIs shall be absent;
- smsCallBarringSupportIndicator shall be absent;
- supportedRAT-TypesIndicator shall be present and populated with the value received within the RAT-Type AVP in the received ULR;
- supportedFeatures shall be present if a SupportedFeature AVP was present in the received ULR which indicated support of odbs and regsubs.

informPreviousNetworkEntity in UpdateGprsLocationArg shall be absent;

ps-LCS-NotSupportedByUE in UpdateGprsLocationArg shall be absent

v-gmlc-Address in UpdateGprsLocationArg shall be absent.

add-info in UpdateGprsLocationArg shall be present if a Terminal-Information AVP was present in the received ULR. If present the parameter shall be poulated with the received IMEI and software version; skipSubscriberDataUpdate in add-info shall be absent.

eps-info in UpdateGprsLocationArg shall be present.

- if the S6a/S6d indicator within the ULR-Flags AVP was set, the parameter shall contain isr-Information with updateLocation indication, and if a Single-Registration-Indication was present in the received ULR-Flags AVP then the isr-Information shall also contain a cancelSGSN indication, and if an InitialAttachIndicator was present in the received ULR-Flags AVP then the isr-Information shall also contain initialAttachIndicator;

- if the S6a/S6d indicator within the ULR-Flags was not set, the parameter shall contain isr-Information with updateLocation indication, and if an InitialAttachIndicator was present within the ULR-Flags AVP, the parameter shall contain isr-Information with initialAttachIndicator.

servingNodeTypeIndicator in UpdateGprsLocationArg shall be present if the S6a/S6d-Indicator was present in the ULR-Flags AVP within the received ULR.

skipSubscriberData Update in UpdateGprsLocationArg shall be present if a skip subscriber data indication was receive within the ULR-Flags within ULR.

usedRAT-Type in UpdateGprsLocationArg shall be populate with the value received within the RAT-Type AVP within ULR.

gprsSubscriptionDataNotNeeded in UpdateGprsLocationArg shall be present if bit 3 (GPRS-Subscription-Data-Indicator) was not set in the ULR-Flags AVP received within ULR.

nodeTypeIndicator in UpdateGprsLocationArg shall be present if bit 4 (Node-Type-Indicator) was set in the ULR-Flags AVP received within ULR.

areaRestricted in UpdateGprsLocationArg shall be absent.

ue-reachableIndicator in UpdateGprsLocationArg shall be absent.

8.2.2 UpdateGprsLocationRes/Error/InsertSubscriberDataArg/ActivateTraceModeArg mapping to ULA

When the IWF needs to construct an ULA command as a result of receiving an UpdateGprsLocation Ack/Error message (see sections 7.2.1 step 5, and 7.2.2 step 7), the IWF shall populate AVPs of ULA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if an UpdateGprsLocationRes parameter was received in a TCAP ResultLast component;

- DIAMETER_ERROR_USER_UNKNOWN if an error of unknownSubscriber without a diagnostic parameter or with a diagnostic parameter of imsiUnknown was received;

- DIAMETER_ERROR_UNKNOWN_SUBSCRIPTION if an error of unknownSubscriber with a diagnostic parameter of gprs-eps-SubscriptionUnknown was received;

- DIAMETER_ERROR_RAT_NOT_ALLOWED if an error of roamingNotAllowed with a roamingNotAllowedParam containing an additionalRoamingNotAllowedCause of "supportedRAT-TypesNotAllowed" was received;

- DIAMETER_ERROR_ROAMING_NOT_ALLOWED if an error of roamingNotAllowed without "supportedRAT-TypesNotAllowed" was received;

- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Supported-Features AVP shall be absent.

ULA-Flags AVP: Flags shall be set as follows:

- **SeparationIndication** shall be set to 1 if the sgsn-mmeSeparationSupported parameter was present within UpdateGprsLocationRes; otherwise shall be set to 0.

Subscription-Data AVP shall be present if MAP InsertSubscriberData messages have been received from the HSS and a "skip-subscriber-Data" indication was not present in the received ULR command or a MAP ActivateTraceMode message has been received from the HSS. If present the AVP shall be populated as follows:

Subscriber status AVP shall be present if a subscriberStatus parameter was present in a received SubscriberData parameter within InsertSubscriberDataArg. If so, values shall be mapped appropriately.

MSISDN AVP shall be present if an msisdn parameter was present in a received SubscriberData parameter within InsertSubscriberDataArg.

STN-SR AVP shall be present if an stn-sr parameter was present in a received EPS-SubscriptionData parameter within InsertSubscriberDataArg.

Network-Access-Mode AVP shall be present if a networkAccessMode parameter was present within InsertSubscriberDataArg.

Operator-Determined-Barring AVP shall be present if an odb-GeneralData parameter was present within an odb-Data parameter within a SubscriberData parameter within InsertSubscriberDataArg.

HPLMN-ODB AVP shall be present if an odb-HPLMN-Data parameter was present within an odb-Data parameter within a SubscriberData parameter within InsertSubscriberDataArg.

Regional-Subscription-Zone-Code AVPs shall be present if ZoneCodes were present within an regionalSubscriptionData parameter within a SubscriberData parameter within InsertSubscriberDataArg.

Access-Restriction-Data AVP shall be present if an accessRestrictionData parameter was present within InsertSubscriberDataArg and/or a ho-to-non-3GPP-Access-Not-Allowed parameter was present in an eps-SubscriptionData parameter within InsertSubscriberDataArg.

APN-OI-Replacement AVP shall be present if an apn-oi-Replacement parameter was present within an eps-SubscriptionData parameter within InsertSubscriberDataArg.

3GPP-Charging-Characteristics AVP shall be present if a chargingCharacteristics parameter was present within InsertSubscriberDataArg.

AMBR AVP shall be present if an ambr parameter was present within an eps-SubscriptionData parameter within InsertSubscriberDataArg.

APN-Configuration-Profile AVP shall be present if an apn-ConfigurationProfile parameter was present within an eps-SubscriptionData parameter within InsertSubscriberDataArg.

RAT-Frequency-Selection-Priority-ID AVP shall be present if a rfsp-id parameter was present within an eps-SubscriptionData parameter within InsertSubscriberDataArg.

- **Trace-Data AVP** shall be present if a MAP ActivateTraceMode message has been received from the HSS. Sub-AVPs in Trace-Data AVP shall be populated as follows:

 - **Trace-Reference** AVP shall be present and populated with the values received within the traceReference and traceReference2 parameters within ActivateTraceModeArg.

 - **Trace-Depth-List** AVP shall be present if a Trace-DepthList parameter was present within ActivateTraceModeArg.

 - **Trace-NE-Type-List** AVP shall be present if a TraceNE-TypeList parameter was present within ActivateTraceModeArg.

 - **Trace-Depth-List** AVP shall be present if a Trace-DepthList parameter was present within ActivateTraceModeArg.

- **Trace-Interface-List** AVP shall be present if a TraceInterfaceList parameter was present within ActivateTraceModeArg.

- **Trace-Event-List** AVP shall be present if a TraceEventList parameter was present within ActivateTraceModeArg.

- **OMC-Id** AVP shall be present if a OMC-Id parameter was present within ActivateTraceModeArg.

- **Trace-Collection-Entity** AVP shall be present if a TraceCollectionEntity parameter was present within ActivateTraceModeArg.

GPRS-Subscription-Data AVP shall be present if a gprsSubscriptionData parameter was present within InsertSubscriberDataArg.

LCS-Info AVP shall be present if a LCS Information parameter was present within InsertSubscriberDataArg.

CSG-Subscription-Data AVPs shall be populated with information received within the csg-SubscriptionDataList parameter within InsertSubscriberDataArg.

Roaming-Restricted-Due-To-Unsupported-Feature AVP shall be present and set to "Roaming-Restricted-Due-To-Unsupported-Feature (0)" if the parameter roamingRestrictedInSgsnDueToUnsupportedFeature was present within InsertSubscriberDataArg. Otherwise shall be absent.

Teleservice-List AVP shall be present if a Teleservice List parameter was present within InsertSubscriberDataArg.

Call-Barring-Info AVPs shall be present if call barring SS-code and SS-status parameters were present within InsertSubscriberDataArg and the SS-Code AVP and SS-Status AVP within the Call-Barring-Info AVPs shall be populated with the values of the received call barring SS-code and SS-status parameters within InsertSubscriberDataArg.

8.2.3 UpdateGprsLocationArg mapping to ULR

When the IWF needs to construct an ULR command as a result of receiving an UpdateGprsLocation message without a pdn-gw-update parameter within eps-info and without an isr-Information parameter within eps-info not indicating updateLocation (see section 7.2.2 step 3), the IWF shall populate AVPs of ULR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of UpdateGprsLocationArg.

Supported-Features AVP shall be populated with a value mapped from received parameter supportedFeatures within sgsn-Capability.

Terminal-Information AVP shall be present if an add-info parameter was received within UpdateGprsLocationArg. If present the received value of the imeisv parameter shall be mapped onto IMEI and (if present) Software Version.

RAT-Type AVP shall be populated with the value received within the usedRAT-Type parameter of UpdateGprsLocationArg

ULR-Flags AVP: Flags shall be set as follows:

Single-Registration-Indication shall be set to 1 if the ISR-Information parameter within the EPS-Info parameter within UpdateGprsLocationArg is present and indicates "cancelSGSN"; otherwise shall be set to 0.

- **S6a/S6d-Indicator** shall be set to 1 if the servingNodeTypeIndicator parameter was present in UpdateGprsLocationArg; otherwise shall be set to 0.

- **Skip Subscriber Data** shall be set to 1 if a skipSubscriberData parameter was present in UpdateGprsLocationArg; otherwise shall be set to 0.

- **GPRS-Subscription-Data-Indicator** shall be set to 1 if the "GPRS Subscription Data not needed Indicator" was absent from UpdateGprsLocationArg; otherwise shall be set to 0.

- **Node-Type-Indicator** shall be set to 1 if the "Node-Type Indicator" was present in UpdateGprsLocationArg; otherwise shall be set to 0.
- **Initial-Attach-Indicator** shall be set to 1 if the initialAttachIndicator parameter within the ISR-Information parameter within the EPS-Info parameter within UpdateGprsLocationArg is present; otherwise shall be set to 0.

Visited-PLMN-Id AVP shall populated with a value derived from the sgsn-Number parameter received within UpdateGprsLocationArg.

SGSN-Number AVP shall be populated with the value received within the SGSN Number parameter of UpdateGprsLocationArg.

8.2.4 ULA mapping to InsertSubscriberDataArg/ ActivateTraceModeArg/UpdateGprsLocationRes/Error

When the IWF needs to construct a MAP InsertSubscriberData messages and/or a MAP- ActivateTraceMode message and/or a MAP-UpdateGprsLocation Ack message, as a result of receiving an ULA command (see sections 7.2.2 steps 5 and 6), the IWF shall populate sub-parameters of InsertSubscriberDataArg, ActivateTraceModeArg and UpdateGprsLocationRes/Error as described below:

InsertSubscriberDataArg:

imsi in InsertSubscriberDataArg shall be absent.

msisdn in InsertSubscriberDataArg shall be populated with the value received within the MSISDN AVP within the Subscription-Data AVP within ULA.

category in InsertSubscriberDataArg shall be absent.

subscriberStatus in InsertSubscriberDataArg shall be populated with the value received within the Subscriber-Status AVP within the Subscription-Data AVP within ULA.

bearerServiceList in InsertSubscriberDataArg shall be absent.

teleserviceList in InsertSubscriberDataArg shall be absent

provisionedSS in InsertSubscriberDataArg shall be absent.

odb-Data in InsertSubscriberDataArg shall be populated with the value received within the Operator-Determined-Barring AVP and HPLMN-ODB AVP AVP within the Subscription-Data AVP within ULA.

roamingRestrictedDueToUnsupportedFeature in InsertSubscriberDataArg shall be absent.

regionalSubscriptionData in InsertSubscriberDataArg shall be populated with the value received within the Regional-Subscription-Zone-Code AVPs within the Subscription-Data AVP within ULA.

vbsSubscriptionData in InsertSubscriberDataArg shall be absent.

vgcsSubscriptionData in InsertSubscriberDataArg shall be absent

vlrCamelsubscriptionInfo in InsertSubscriberDataArg shall be absent.

naea-PreferredCI in InsertSubscriberDataArg shall be absent.

gprsSubscriptionData in InsertSubscriberDataArg shall be populated with GPRS-Subscription Data received within the Subscription-Data AVP within ULA.

roamingRestrictedInSgsnDueToUnsupportedFeature in InsertSubscriberDataArg shall be present if a Roaming-Restricted-Due-To-Unsupported-Feature AVP Subscription-Data AVP within ULA.

networkAccessMode in InsertSubscriberDataArg shall be populated with the value received within the Network-Access-Mode AVP within the Subscription-Data AVP within ULA.

lsaInformation in InsertSubscriberDataArg shall be absent.

lmu-Indicator in InsertSubscriberDataArg shall be absent

lcsInformation in InsertSubscriberDataArg shall be absent.

istAlertTimer in InsertSubscriberDataArg shall be absent.

superChargerSupportedInHLR in InsertSubscriberDataArg shall be absent.

mc-SS-Info in InsertSubscriberDataArg shall be absent.

cs-AllocationRetentionPriority in InsertSubscriberDataArg shall be absent.

sgsn-CAMEL-SubscriptionInfo in InsertSubscriberDataArg shall be absent.

chargingCharacteristics in InsertSubscriberDataArg shall be populated with the value received within the 3GPP-Charging-Characteristics AVP within the Subscription-Data AVP within ULA.

accessRestrictionData in InsertSubscriberDataArg shall be populated with the value received within the Access-Restriction-Data AVP within the Subscription-Data AVP within ULA.

ics-Indicator in InsertSubscriberDataArg shall be absent.

LCS Information in InsertSubscriberDataArg shall be populated with the value received within the LCS-Info AVP within the Subscription-Data AVP within ULA.

Teleservice List in InsertSubscriberDataArg shall be populated with the value received within the Teleservice-List AVP within the Subscription-Data AVP within ULA.

SS-code and SS-status parameters of **Call Barring Information List** in InsertSubscriberDataArg shall be populated with the values of SS-Code AVP and SS-Status AVP received within the Call-Barring-Info AVPs within the Subscription-Data AVP within ULA.

Sub-parameters of **eps-SubscriptionData** in InsertSubscriberDataArg shall be populated as follows:

apn-oi-Replacement shall be populated with the value received in the APN-OI-Replacement AVP within the Subscription-Data AVP within ULA.

rfsp-id shall be populated with the value received within the RAT-Frequency-Selection-Priority-ID AVP within the Subscription-Data AVP within ULA.

ambr shall be populated with the value received within the AMBR AVP within the Subscription-Data AVP within ULA.

apn-ConfigurationProfile shall be populated with the value received within the APN-Configuration-Profile AVP within the Subscription-Data AVP within ULA.

stn-sr shall be populated with the value received within the STN-SR AVP within the Subscription-Data AVP within ULA.

csg-SubscriptionDataList shall be populated with values received within CSG-Subscription-Data AVPs within the Subscription-Data AVP within ULA.

ue-ReachabilityRequestIndicator shall be absent.

ActivateTraceModeArg:

imsi in ActivateTraceModeArg shall be absent.

TraceReference shall be populated with the value of Trace-ID part of the Trace-Reference AVP received within the Trace-Data AVP within the Subscription-Data AVP within ULA.

TraceType shall be present with any value.

TraceReference2 shall be populated with the value of MCC+MNC part of the Trace-Reference AVP received within the Trace-Data AVP within the Subscription-Data AVP within ULA.

TraceDepthList shall be populated with the value received in the Trace-Depth-List AVP within the Trace-Data AVP within the Subscription-Data AVP within ULA.

TraceNE-TypeList shall be populated with the value received in the Trace-NE-Type-List AVP within the Trace-Data AVP within the Subscription-Data AVP within ULA.

TraceInterfaceList shall be populated with the value received in the Trace-Interface-List AVP within the Trace-Data AVP within the Subscription-Data AVP within ULA.

TraceEventList shall be populated with the value received in the Trace-Event-List AVP within the Trace-Data AVP within the Subscription-Data AVP within ULA.

Omc-Id shall be populated with the value received in the OMC-Id AVP within the Trace-Data AVP within the Subscription-Data AVP within ULA

TraceCollectionEntity shall be populated with the address received within the Trace-Collection-Entity AVP within the Subscription-Data AVP within ULA.

UpdateGprsLocationRes:

hlr-Number in UpdateGprsLocationRes shall be populated with a value locally assigned to the IWF and consistent with SS7 routing principles.

extensionContainer in UpdateGprsLocationRes shall be absent.

add-Capability in UpdateGprsLocationRes shall be present.

sgsn-mmeSeparationSupported in UpdateGprsLocationRes shall be present if the Separation Indication within the ULA-Flags AVP was set to 1 within ULA.

UpdateGprsLocation Error:

An error of **unknownSubscriber** with unknownSubscriberParam containing a unknownSubscriberDiagnostic of "imsiUnknown" shall be sent if the received ULA command contains an Experimental-Result AVP with a value of "User Unknown".

An error of **unknownSubscriber** with unknownSubscriberParam containing a unknownSubscriberDiagnostic of "gprs-epsSubscriptionUnknown" shall be sent if the received ULA command contains an Experimental-Result AVP with a value of "Unknown EPS Subscription".

Other values within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.3 Mapping of Parameters for the Cancel Location Procedure

8.3.1 CancelLocationArg mapping to CLR

When the IWF needs to construct a CLR command as a result of receiving a MAP-CancelLocation message (see sections 7.3.1 step 2, and 7.3.2 step 3), the the IWF shall populate AVPs of CLR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the imsi value received within the identity parameter of CancelLocationArg.

Supported-Features AVP shall be absent.

CancellationType AVP shall contain the value MME_UPDATE_PROCEDURE if the parameter CancellationType within CancelLocationArg was set to updateProcedure and typeOfUpdate within CancelLocationArg was set to mme-change; the AVP shall contain the value SGSN_UPDATE_PROCEDURE if the parameter CancellationType within CancelLocationArg was set to updateProcedure and typeOfUpdate within CancelLocationArg was set to sgsn-change; the AVP shall contain the value SUBSCRIPTION_WITHDRAWAL if the parameter CancellationType within CancelLocationArg was set to subscriptionWithdraw; the AVP shall contain the value UPDATE_PROCEDURE_IWF if the parameter CancellationType within CancelLocationArg was set to updateProcedure and typeOfUpdate within CancelLocationArg was absent; the AVP shall contain the value INITIAL_ATTACH_PROCEDURE if the parameter CancellationType within CancelLocationArg was set to InitialAttachProcedure.

8.3.2 CLA mapping to CancelLocationRes/Error

When the IWF needs to construct MAP-CancelLocation Ack message as a result of receiving an CLA command (see sections 7.3.1 step 4 and 7.3.2.step 5), the IWF shall populate sub-parameters of CancelLocationRes/Error as described below:

CancelLocationRes:

extensionContainer in CancelLocationRes shall be absent.

CancelLocation Error:

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.3.3 CLR mapping to CancelLocationArg

When the IWF needs to construct a MAP-CancelLocation message as a result of receiving an CLR command (see sections 7.3.2 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of CancelLocationArg as described below:

identity in CancelLocationArg shall be populated with the imsi value of the User-Name AVP received within CLR.

cancellationType in CancelLocationArg shall contain a value of updateProcedure if the Cancellation-Type AVP received in CLR contains the value MME_UPDATE_PROCEDURE or SGSN_UPDATE_PROCEDURE. The parameter shall contain a value of subscriptionWithdraw if the Cancellation-Type AVP received in CLR contains the value SUBSCRIPTION_WITHDRAWAL. The parameter shall contain a value of InitialAttachProcedure if the Cancellation-Type AVP received in CLR contains the value INITIAL_ATTACH_PROCEDURE.

extensionContainer in CancelLocationArg shall be absent.

typeOfUpdate in CancelLocationArg shall be set to sgsn-change if SGSN_UPDATE_PROCEDURE was received in the Cancellation-Type AVP within CLR. It shall be set to mme-change if MME_UPDATE_PROCEDURE was received in Cancellation-Type AVP within CLR. Otherwise shall be absent.

8.3.4 CancelLocationRes / Error mapping to CLA

When the IWF needs to construct an CLA command as a result of receiving a CancelLocation Ack/Error message (see sections 7.3.2 step 6), the IWF shall populate AVPs of CLA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if a CancelLocationRes parameter was received in a TCAP ResultLast component;
- an appropriate DIAMETER base protocol result code otherwise.

Supported-Features AVP shall be absent.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

8.4 Mapping of Parameters for the Purge Procedure

8.4.1 PUR mapping to PurgeMS-Arg

When the IWF needs to construct a MAP-PurgeMS message as a result of receiving an PUR command (see sections 7.4.1 step 2 and 7.4.2. step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of PurgeMS-Arg as described below:

imsi in PurgeMS-Arg shall be populated with the imsi value of the User-Name AVP received within PUR.

vlr-Number in PurgeMS-Arg shall be absent.

sgsn-Number in PurgeMS-Arg shall be populated with a value locally assigned to the IWF and consistent with SS7 routing principles.

extensionContainer in PurgeMS-Arg shall be absent.

8.4.2 PurgeMS-Res / Error mapping to PUA

When the IWF needs to construct an PUA command as a result of receiving a PurgeMS Ack/Error message (see sections 7.4.1 step 4 and 7.4.2. step 6), the IWF shall populate AVPs of PUA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if a PurgeMS-Res parameter was received in a TCAP ResultLast component;
- DIAMETER_ERROR_USER_UNKNOWN if an error of unknownSubscriber without a diagnostic parameter or with a diagnostic parameter of imsiUnknown or gprs-eps-SubscriptionUnknown was received;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

PUA-Flags AVP: Flags shall be set as follows:

- **Freeze M-TMSI** shall be set to 1 if the freezeM-TMSI parameter was present within PurgeMS-Res; otherwise shall be set to 0.
- **Freeze P-TMSI** shall be set to 1 if the freezeP-TMSI parameter was present within PurgeMS-Res; otherwise shall be set to 0.

8.4.3 PurgeMS-Arg mapping to PUR

When the IWF needs to construct a PUR command as a result of receiving a MAP-PurgeMS message (see section 7.4.2 step 3), the the IWF shall populate AVPs of PUR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of PurgeMS-Arg.

Supported-Features AVP shall be absent.

8.4.4 PUA mapping to PurgeMS-Res/Error

When the IWF needs to construct MAP-PurgeMS Ack message as a result of receiving a PUA command (see section 7.4.2.step 5), the IWF shall populate sub-parameters of PurgeMS-Res/Error as described below:

PurgeMS-Res:

freezeTMSI in PurgeMS-Res shall be absent.

freezeP-TMSI in PurgeMS-Res shall be present if a Freeze-P-TMSI indication was received within the PUA-Flags AVP within PUA.

extensionContainer in PurgeMS-Res shall be absent.

freezeM-TMSI in PurgeMS-Res shall be present if a Freeze-M-TMSI indication was received within the PUA-Flags AVP within PUA.

PurgeMS Error:

An error of **unknownSubscriber** with unknownSubscriberParam containing a unknownSubscriberDiagnostic of "imsiUnknown" shall be sent if the received AIA command contains an Experimental-Result AVP with a value of "User Unknown".

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.5 Mapping of Parameters for the Insert Subscriber Data Procedure

8.5.1 InsertSubscriberDataArg mapping to IDR

When the IWF needs to construct an IDR command as a result of receiving a MAP-InsertSubscriberData message (see sections 7.5.1 step 2, and 7.5.2 step 3), the IWF shall populate AVPs of IDR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of InsertSubscriberDataArg.

Supported-Features AVP shall be absent.

Subscription-Data AVP: See chapter 8.2.2.

IDR-Flags AVP: Flags shall be set as follows:

UE Reachability Request shall be set to 1 if the ue-reachabilityRequestIndicator was present within InsertSubscriberDataArg; othewise shall be set to 0 or the AVP shall be absent.

8.5.2 IDA mapping to InsertSubscriberDataRes/Error

When the IWF needs to construct a MAP-InsertSubscriberData Ack message as a result of receiving an IDA command (see sections 7.5.1 step 4 and 7.5.2.step 5), the IWF shall populate sub-parameters of InsertSubscriberDataRes/Error as described below:

InsertSubscriberDataRes:

teleserviceList in InsertSubscriberDataRes shall include all teleserviceCodes that have been received within InsertSubscriberDataArg.

bearerServiceList in InsertSubscriberDataRes shall include all bearerServiceCodes that have been received within InsertSubscriberDataArg.

ss-List in InsertSubscriberDataRes shall include all ssCodes that have been received within InsertSubscriberDataArg.

odb-GeneralData in InsertSubscriberDataRes shall include all odb categoties that have been requested within the received InsertSubscriberDataArg but are not supported by the serving node as indicated within the Supported-Feature AVP within IDA.

regionalSubscriptionResponse in InsertSubscriberDataRes
-shall be set to regionalSubscNotSupported if regional subscription was requested within the received InsertSubscriberDataArg but is not supported by the serving node as indicated within the Supported-Feature AVP within IDA.
-shall be set to networkNode-AreaRestricted if regional subscription was requested within the received InsertSubscriberDataArg but a Network-Node-Area-Restricted indication has been received within the IDA-Flags AVP within IDA.
- otherwise shall be absent.

supportedCamelPhases in InsertSubscriberDataRes shall be absent or shall indicate that no CAMEL phase is supported.

extensionContainer in CancelLocationRes shall be absent.

offeredCamel4CSIs in InsertSubscriberDataRes shall be absent.

supportedFeatures in InsertSubscriberDataRes shall be populated with the information received within the Supported-Features AVP within IDA.

InsertSubscriberData Error:

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.5.3 IDR mapping to InsertSubscriberDataArg/ ActivateTraceModeArg

When the IWF needs to construct a MAP-InsertSubscriberData message or a MAP-ActivateTraceMode message as a result of receiving an IDR command (see sections 7.5.2 step 2, and 7.10.2 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of InsertSubscriberDataArg/ActivateTraceModeArg as described below:

InsertSubscriberDataArg:

imsi in InsertSubscriberDataArg shall be populated with the value received within the User-Name AVP within IDR.

msisdn in InsertSubscriberDataArg shall be populated with the value received within the MSISDN AVP within the Subscription-Data AVP within IDR.

category in InsertSubscriberDataArg shall be absent.

subscriberStatus in InsertSubscriberDataArg shall be populated with the value received within the Subscriber-Status AVP within the Subscription-Data AVP within IDR.

bearerServiceList in InsertSubscriberDataArg shall be absent.

teleserviceList in InsertSubscriberDataArg shall be absent

provisionedSS in InsertSubscriberDataArg shall be absent.

odb-Data in InsertSubscriberDataArg shall be populated with the value received within the Operator-Determined-Barring AVP and HPLMN-ODB AVP AVP within the Subscription-Data AVP within IDR.

roamingRestrictedDueToUnsupportedFeature in InsertSubscriberDataArg shall be absent.

regionalSubscriptionData in InsertSubscriberDataArg shall be populated with the value received within the Regional-Subscription-Zone-Code AVPs within the Subscription-Data AVP within IDR.

vbsSubscriptionData in InsertSubscriberDataArg shall be absent.

vgcsSubscriptionData in InsertSubscriberDataArg shall be absent

vlrCamelsubscriptionInfo in InsertSubscriberDataArg shall be absent.

naea-PreferredCI in InsertSubscriberDataArg shall be absent.

gprsSubscriptionData in InsertSubscriberDataArg shall bepopulated with GPRS-Subscription Data received within the Subscription-Data AVP within IDR.

roamingRestrictedInSgsnDueToUnsupportedFeature in InsertSubscriberDataArg shall be present if a Roaming-Restricted-due-To-Unsupported-Feature AVP was received within the Subscription-Data AVP within IDR.

networkAccessMode in InsertSubscriberDataArg shall be populated with the value received within the Network-Access-Mode AVP within the Subscription-Data AVP within IDR.

lsaInformation in InsertSubscriberDataArg shall be absent.

lmu-Indicator in InsertSubscriberDataArg shall be absent

lcsInformation in InsertSubscriberDataArg shall be absent.

istAlertTimer in InsertSubscriberDataArg shall be absent.

superChargerSupportedInHLR in InsertSubscriberDataArg shall be absent.

mc-SS-Info in InsertSubscriberDataArg shall be absent.

cs-AllocationRetentionPriority in InsertSubscriberDataArg shall be absent.

sgsn-CAMEL-SubscriptionInfo in InsertSubscriberDataArg shall be absent.

chargingCharacteristics in InsertSubscriberDataArg shall be populated with the value received within the 3GPP-Charging-Characteristics AVP within the Subscription-Data AVP within IDR.

accessRestrictionData in InsertSubscriberDataArg shall be populated with the value received within the Access-Restriction-Data AVP within the Subscription-Data AVP within IDR.

ics-Indicator in InsertSubscriberDataArg shall be absent.

LCS Information in InsertSubscriberDataArg shall be populated with the value received within the LCS-Info AVP within the Subscription-Data AVP within ULA.

Teleservice List in InsertSubscriberDataArg shall be populated with the value received within the Teleservice-List AVP within the Subscription-Data AVP within ULA.

Call Barring Information List in InsertSubscriberDataArg shall be populated with the value received within the Call- Barring-Infor-List AVP within the Subscription-Data AVP within ULA.

Sub-parameters of **eps-SubscriptionData** in InsertSubscriberDataArg shall be populated as follows:

apn-oi-Replacement shall be populated with the value received in the APN-OI-Replacement AVP within the Subscription-Data AVP within IDR.

rfsp-id shall be populated with the value received within the RAT-Frequency-Selection-Priority-ID AVP within the Subscription-Data AVP within IDR.

ambr shall be populated with the value received within the AMBR AVP within the Subscription-Data AVP within IDR.

apn-ConfigurationProfile shall be populated with the value received within the APN-Configuration-Profile AVP within the Subscription-Data AVP within IDR.

stn-sr shall be populated with the value received within the STN-SR AVP within the Subscription-Data AVP within IDR.

csg-SubscriptionDataList in InsertSubscriberDataArg shall be populated with information received within the CSG-Subscription-Data AVPs within the Subscription-Data AVP within IDR.

ue-ReachabilityRequestIndicator in the InsertSubscriberDataArg shall be present if the corresponding information was present within the IDR-Flags AVP within an IDR; otherwise it shall be absent.

ActivateTraceModeArg:

imsi shall be populated with the value received within the User-Name AVP within IDR.

TraceReference shall be populated with the value of Trace-ID part of the Trace-Reference AVP received within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceType shall be present with any value.

TraceReference2 shall be populated with the value of MCC+MNC part of the Trace-Reference AVP received within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceDepthList shall be populated with the value received in the Trace-Depth-List AVP within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceNE-TypeList shall be populated with the value received in the Trace-NE-Type-List AVP within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceInterfaceList shall be populated with the value received in the Trace-Interface-List AVP within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceEventList shall be populated with the value received in the Trace-Event-List AVP within the Trace-Data AVP within the Subscription-Data AVP within IDR.

Omc-Id shall be populated with the value received in the OMC-Id AVP within the Trace-Data AVP within the Subscription-Data AVP within IDR.

TraceCollectionEntity shall be populated with the address received within the Trace-Collection-Entity AVP within the Subscription-Data AVP within IDR.

8.5.4 InsertSubscriberDataRes / Error mapping to IDA

When the IWF needs to construct an IDA command as a result of receiving an InsertSubscriberData Ack/Error message (see sections 7.5.2 step 8), the IWF shall populate AVPs of IDA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if no InsertSubscriberData error component was received;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

IDA-Flags AVP**:** Flags shall be set as follows:
- **Network-Node-Area-Restricted** shall be set to 1 if the regionalSubscriptionResponse parameter within InsertSubscriberDataRes indicated regionalSubscNotSupported; otherwise shall be set to 0.

Supported-Features AVP: Support of features shall be indicated according to information received within the supportedFeatures parameter within InsertSubscriberDataRes.

8.6 Mapping of Parameters for the Delete Subscriber Data Procedure

8.6.1 DeleteSubscriberDataArg mapping to DSR

When the IWF needs to construct a DSR command as a result of receiving a MAP-DeleteSubscriberData message (see sections 7.6.1 step 2, and 7.6.2 step 3), the the IWF shall populate AVPs of DSR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of DeleteSubscriberDataArg.

Supported-Features AVP shall be absent.

DSR-Flags AVP: Flags shall be set as follows:

- **RegionalSubscriptionWithdrawal** shall be set to 1 if a regionalSubscriptionIdentifier parameter was present in DeleteSubscriberDataArg; otherwise shall be set to 0.
- **Complete APN Configuration Profile Withdrawal** shall be set to 1 if the allEPS-Data parameter was present within the EPS-SubscriptionDataWithdraw parameter within DeleteSubscriberDataArg; otherwise shall be set to 0.
- **Subscribed Charging Characteristics Withdrawal** shall be set to 1 if the chargingCharacteristicsWithdraw parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.
- **PDN Subscription Context Withdrawal** shall be set to 1 if the contextIdList parameter was present within the EPS-SubscriptionDataWithdraw parameter within DeleteSubscriberDataArg; otherwise shall be set to 0.
- **STN-SR** shall be set to 1 if the stn-srWithdraw parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.
- **GMLC List Withdrawal** shall be set to 1 if the GMLC List Withdraw parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **LCS Withdrawal** shall be set to 1 if the SS code list parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **Complete PDP context list Withdrawal** shall be shall be set to 1 if the allGPRS-Data parameter was present within the GPRS-SubscriptionDataWithdraw parameter within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **PDP context Withdrawal** shall be set to 1 if the contextIdList parameter was present within the GPRS-SubscriptionDataWithdraw parameter within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **Roaming Restricted in due to unsupported feature** shall be set to 1 if the roamingRestrictedInSgsnDueToUnsupportedFeature parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **Trace Data Withdrawal** shall be set to 0.

- **CSG Deleted** shall be set to 1 if the csg-SubscriptionDeleted parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **APN-OI-Replacement** shall be set to 1 if the apn-oi-replacementWithdraw parameter was present within DeleteSubscriberDataArg; otherwise shall be set to 0.

- **SMS Withdrawal** shall be set to 1 if the SS-Code list parameter was present within DeleteSubscriberDataArg and the service codes are related to short message services; otherwise shall be set to 0.

Context-Identifier AVPs shall be populated with values received within the contextIdList parameter within EPS-SubscriptionDataWithdraw or GPRS-SubscriptionDataWithdraw within DeleteSubscriberDataArg;

8.6.2 DSA mapping to DeleteSubscriberDataRes/Error

When the IWF needs to construct a MAP-DeleteSubscriberData Ack message as a result of receiving a DSA command (see sections 7.6.1 step 4 and 7.6.2.step 5), the IWF shall populate sub-parameters of DeleteSubscriberDataRes/Error as described below:

DeleteSubscriberDataRes:

regionalSubscriptionResponse in DeleteSubscriberDataRes shall be set to:

- regionalSubscNotSupported if a corresponding information was received within the Supported-Feature AVP within DSA .

- networkNode-AreaRestricted if a Network-Node-Area-Restricted indication was received within the DSA-Flags AVP within DSA.

extensionContainer in DeleteSubscriberDataRes shall be absent.

DeleteSubscriberData Error:

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.6.3 DSR mapping to DeleteSubscriberDataArg/ DeactivateTraceModeArg

When the IWF needs to construct a MAP-DeleteSubscriberData message or a MAP-DeactivateTraceMode message as a result of receiving a DSR command (see sections 7.6.2 step 2, 7.11.2 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of DeleteSubscriberDataArg/DeactivateTraceModeArg as described below:

DeleteSubscriberDataArg:

imsi in DeleteSubscriberDataArg shall be populated with the value of the User-Name AVP received within DSR.

basicServiceList in DeleteSubscriberDataArg shall be absent.

ss-List in DeleteSubscriberDataArg shall be absent.

roamingRestrictionDueToUnsupportedFeature in DeleteSubscriberDataArg shall be absent.

regionalSubscriptionIdentifier in DeleteSubscriberDataArg shall be present if a Regional-Subscription-Withdrawal indication has been received within the DSR-Flags AVP within DSR. If present, the value of the ZoneCode is arbitrary.

vbsGroupIndication in DeleteSubscriberDataArg shall be absent.

vgcsGroupIndication in DeleteSubscriberDataArg shall be absent.

camelSubscriptionInfoWithdraw in DeleteSubscriberDataArg shall be absent.

extensionContainer in DeleteSubscriberDataArg shall be absent.

gprsSubscriptionDataWithdraw in DeleteSubscriberDataArg shall be present if corresponding information was received within the DSR-Flags AVP and GPRS-Context-Identifier AVPs within DSR.

roamingRestrictedInSgsnDueToUnsupportedFeature in DeleteSubscriberDataArg shall be present if a corresponding indication has been received within the DSR-Flags AVP within DSR.

lsaInformationWithdraw in DeleteSubscriberDataArg shall be absent.

gmlc-ListWithdraw in DeleteSubscriberDataArg shall be absent.

istInformationWithdraw in DeleteSubscriberDataArg shall be absent.

specificCSI-Withdraw in DeleteSubscriberDataArg shall be absent.

chargingCharacteristicsWithdraw in DeleteSubscriberDataArg shall be present if a Subscribed-Charging-Characteristics-Withdrawl indication was received within the DSR-Flags AVP within DSR.

stn-srWithdraw in DeleteSubscriberDataArg shall be present if a STN-SR indication was received within the DSR-Flags AVP within DSR.

epsSubscriptionDataWithdraw in DeleteSubscriberDataArg shall be present if a Complete-APN-Configuration-Profil-Withdrawal indication or a PDN-Subscription-Context-Withdrawl indication was received within the DSR-Flags AVP. The sub-parameter allEPS-Data shall be present if a Complete-APN-Configuration-Profile-Withdrawl indication was was received in the DSR-Flags AVP within DSR. The sub-parameter contextIdList shall be present if a PDN-Subscription-Context-Withdrawl indication was received within the DSR-Flags AVP within DSR; if so, the contextIdList shall be populatede with values received within the Context-Identifier AVPs within DSR.

GMLC List Withdraw in DeleteSubscriberDataArg shall be present if a GMLC List Withdrawal indication was received within the DSR-Flags AVP.

SS-Code List in DeleteSubscriberDataArg shall be present if corresponding information was received within the DSR-Flags AVP and SS-Code AVPs within DSR.

apn-oi-replacementWithdraw in DeleteSubscriberDataArg shall be present if a APN-OI-Replacement indication was received within the DSR-Flags AVP within DSR.

csg-SubscriptionDeleted in DeleteSubscriberDataArg shall be present if a CSG Deleted indication was received within the DSR-Flags AVP within DSR.

SS-Code List in DeleteSubscriberDataArg shall be present if SMS Withdrawal bit was set within the DSR-Flags AVP and SS-Code AVPs was within DSR.

DeactivateTraceModeArg:

imsi in DeactivateTraceModeArg shall be populated with the value received within the User-Name AVP within DSR.

TraceReference in DeactivateTraceModeArg shall be populated with the value of Trace-ID part of the Trace-Reference AVP received within DSR.

TraceReference2 in DeactivateTraceModeArg shall be populated with the value of MCC+MNC part of the Trace-Reference AVP received within DSR.

8.6.4 DeleteSubscriberDataRes / Error mapping to DSA

When the IWF needs to construct a DSA command as a result of receiving a DeleteSubscriberData Ack/Error message (see sections 7.6.2 step 6), the IWF shall populate AVPs of DSA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if a DeleteSubscriberDataRes parameter was received in a TCAP ResultLast component;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Supported-Features AVP shall be present and shall indicate support of Regional Subscription if a Regional-Subscription-Withdrawal indication was present within the DSR-Flags AVP within DSR and no regionalSubscNotSupported indication was received in regionalSubscriptionResponse in DeleteSubscriberDataRes.

DSA-Flags AVP: Flags shall be set as follows:

- **Network-Node-Area-Restricted** shall be set to 1 if a networkNode-AreaRestricted indication was received within the regionalSubscriptionResponse parameter within DeleteSubscriberDataRes; otherwise shall be set to 0.

8.7 Mapping of Parameters for the Reset Procedure

8.7.1 Reset (v1 or v2) mapping to RSR

When the IWF needs to construct a RSR command as a result of receiving a MAP-Reset message with AC version 1 or version 2 (see sections 7.7.1 step 2, and 7.7.2 step 4), the the IWF shall populate AVPs of RSR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Id AVPs shall be populated with the values received within the HLR-Id parameters within hlr-list within ResetArg.

Supported-Features AVP shall be absent.

8.7.2 RSR mapping to ResetArg (v1 or v2)

When the IWF needs to construct MAP-Reset message as a result of receiving a RSR command (see section 7.7.2 step 2), the IWF shall open a MAP dialogue in version 1 or version 2 according to an implementation option; note that the IWF shall be prepared to fall back to v1 when v2 is chosen. Sub-parameters of ResetArg shall be populated as described below:

networkResource in ResetArg (only v1) shall be set to hlr.

hlr-Number in ResetArg shall be populated with a value locally assigned to the IWF and consistent with SS7 routing principles.

hlr-List in ResetArg shall be populated with values received within User-Id AVPs within RSR.

8.8 Mapping of Parameters for the Notification Procedure

8.8.1 NOR mapping to UpdateGprsLocation-Arg

When the IWF needs to construct a MAP-UpdateGprsLocation message as a result of receiving an NOR command (see sections 7.8.1 step 2 and 7.8.2. step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of UpdateGprsLocation-Arg as described below:

imsi in UpdateGprsLocationArg shall be populated with the value of the User-Name AVP received within NOR.

sgsn-Number in UpdateGprsLocationArg shall be populated with a value locally assigned to the IWF and consistent with SS7 routing principles.

sgsn-Address in UpdateGprsLocationArg shall be populated with the IP-address of the source node sending the NOR command.

extensionContainer in UpdateGprsLocationArg shall be absent.

sgsn-Capability in UpdateGprsLocationArg shall be absent.

informPreviousNetworkEntity in UpdateGprsLocationArg shall be absent;

ps-LCS-NotSupportedByUE in UpdateGprsLocationArg shall be absent

v-gmlc-Address in UpdateGprsLocationArg shall be absent.

add-info in UpdateGprsLocationArg shall be present if a Terminal-Information AVP was present in the received NOR. If present the parameter shall be populated with the received IMEI and software version, and with a skipSubscriberDataUpdate indication.

eps-info in UpdateGprsLocationArg shall be present and contain a pdn-gw-update parameter if the received NOR contained a MIP6-Agent-Info AVP. It shall be present and contain a isr-Information parameter if the received NOR contained a Single-Registration-Indication indication within the NOR-Flags AVP.

servingNodeTypeIndicator in UpdateGprsLocationArg shall be present.

skipSubscriberData Update in UpdateGprsLocationArg shall be present.

usedRAT-Type in UpdateGprsLocationArg shall be absent.

gprsSubscriptionDataNotNeeded in UpdateGprsLocationArg shall be absent.

nodeTypeIndicator in UpdateGprsLocationArg shall be absent.

areaRestricted in UpdateGprsLocationArg shall be present if the corresponding information was received within the NOR-Flags AVP within a NOR; otherwise it shall be absent.

ue-reachableIndicator in UpdateGprsLocationArg shall be present if the corresponding information was received within the NOR-Flags AVP within a NOR; otherwise it shall be absent.

8.8.2 UpdateGprsLocation-Arg mapping to NOR

When the IWF needs to construct a NOR command as a result of receiving a MAP-UpdateGprsLocation message with a pdn-gw-update parameter within eps-info or with an isr-Information parameter within eps-info not indicating updateLocation (see section 7.8.2 step 4), the the IWF shall populate AVPs of NOR as described below:

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

User-Name AVP shall be populated with the value received within the imsi parameter of UpdateGprsLocation-Arg.

Supported-Features AVP shall be absent.

Terminal-Information AVP shall be present if an add-info parameter was present inUpdateGprsLocationArg..

MIP6-Agent-Info AVP shall be present if pdn-gw-Identity was received within pdn-gw-update parameter within eps-info within UpdateGprsLocationArg.

Service-Selection AVP shall be present if apn was received within pdn-gw-update parameter within eps-info within UpdateGprsLocationArg.

NOR-Flags AVP: Flags shall be set as follows:

- Single-Registration-Indication shall be set to 1 if a cancelSGSN indication was received within the ISR-Information within the eps-info within the UpdateGprsLocationArg; otherwise it shall be set to 0.
- SGSN area restricted shall be set to 1 if an sgsnAreaRestricted indication was received within the UpdateGprsLocationArg; otherwise it shall be set to 0.
- Ready for SM shall be set to 0.
- UE Reachable shall be set to 1 if a ue-reachableIndicator was received within the UpdateGprsLocationArg; otherwise it shall be set to 0.

Context-Identifier AVP shall be present if contextId was received within pdn-gw-update parameter within eps-info within UpdateGprsLocationArg.

8.8.3 NOR mapping to ReadyForSM-Arg

When the IWF needs to construct a MAP-ReadyForSM message as a result of receiving an NOR command (see sections 7.8.1 step 2 and 7.8.2. step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of ReadyForSMArg as described below:

imsi in ReadyForSMArg shall be populated with the value of the User-Name AVP received within NOR.

alertReason in ReadyForSMArg shall be populated with the value of the Alert-Reason AVP received within NOR.

alertReasonIndicator in ReadyForSMArg shall be present.

additionalAlertReasonIndicator in ReadyForSMArg shall be absent.

extensionContainer in ReadyForSMArg shall be absent.

8.8.4 ReadyForSM-Arg mapping to NOR

When the IWF needs to construct a NOR command as a result of receiving a MAP-ReadyForSM message (see section 7.8.2 step 4), the the IWF shall populate AVPs of NOR as described below:

User-Name AVP shall be populated with the value received within the imsi parameter of ReadyForSMArg.

Supported-Features AVP shall be absent.

Terminal-Information AVP shall be absent.

MIP6-Agent-Info AVP shall be absent.

Context-Identifier AVP shall be absent.

Service-Selection AVP shall be absent.

Alert-Reason AVP shall be present and populated with the value received within the alertReason parameter of ReadyForSMArg.

NOR-Flags AVP: Flags shall be set as follows:

- Single-Registration-Indication shall be set to 0.
- SGSN area restricted shall be set to 0.
- Ready for SM shall be set to 1.

- UE Reachable shall be set to 0.

8.9 Mapping of Parameters for the IMEI Check Procedure

8.9.1 ECR mapping to CheckIMEI-Arg

When the IWF needs to construct a MAP-CheckIMEI message as a result of receiving an ECR command (see section 7.9.1 step 2), the IWF shall open a MAP dialogue in application context version 3 and populate sub-parameters of CheckIMEI-Arg as described below:

imei in CheckIMEI-Arg shall be populated with the imei (and software version) as received within the Terminal-Information AVP within ECR.

requestedEquipmentInfo in CheckIMEI-Arg shall indicate equipmentStatus.

extensionContainer in CheckIMEI-Arg shall be absent.

8.9.2 CheckIMEI-Res / Error mapping to ECA

When the IWF needs to construct an ECA command as a result of receiving a CheckIMEI Ack/Error message (see section 7.9.1 step 4), the IWF shall populate AVPs of ECA as described below:

Result-Code / Experimental-Result AVP shall be set to:

- DIAMETER_SUCCESS if a CheckIMEI-Res parameter was received in a TCAP ResultLast component;
- DIAMETER_ERROR_UNKNOWN_EQUIPMENT if an error of unknownEquipment was received;
- an appropriate DIAMETER base protocol result code otherwise.

Auth-Session-State AVP shall be set to the value NO_STATE_MAINTAINED (1).

Equipment-Status AVP shall be populated with a value as received within the equipmentStatus parameter within CheckIMEI-Res.

8.10 Mapping of Parameters for the Trace Activate Procedure

8.10.1 ActivateTraceMode-Arg mapping to IDR

When the IWF needs to construct an IDR command as a result of receiving a MAP-ActivateTraceMode message (see sections 7.10.1 step 2), the IWF shall populate AVPs of the IDR as described below:

User-Name AVP shall be populated with the value received within the imsi parameter of ActivateTraceModeArg.

Supported-Features AVP shall be absent.

Subscription-Data AVP shall be present and populated as follows:

Trace-Data AVP shall be present and populated as in chapter 8.2.2.

All other sub-AVPs shall be absent.

8.10.2 IDA mapping to ActivateTraceMode-Res / Error

When the IWF needs to construct a MAP-ActivateTraceMode Ack message as a result of receiving an IDA command (see sections 7.10.1 step 4), the IWF shall populate sub-parameters of ActivateTraceMode Res/Error as described below:

ActivateTraceModeRes:

traceSupportIndicator shall be present if an indication of support of this feature was received within the Supported-Feature AVP within IDA; Otherwise, it shall be absent.

extensionContainer shall be absent.

ActivateTraceMode Error:

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

8.11 Mapping of Parameters for the Trace Deactivate Procedure

8.11.1 DeactivateTraceMode-Arg mapping to DSR

When the IWF needs to construct an DSR command as a result of receiving a MAP-DeactivateTraceMode message (see sections 7.11.1 step 2), the IWF shall populate AVPs of DSR as described below:

User-Name AVP shall be populated with the value received within the imsi parameter of DeactivateTraceModeArg.

Trace-Reference AVP shall be populated with the values received within the traceReference and traceReference2 parameters of DeactivateTraceModeArg.

Supported-Features AVP shall be absent.

DSR-Flags AVP: Trace Data Withdrawal shall be set to 1. All other Flags shall be set as 0.

Context-Identifier AVPs shall be absent.

8.11.2 DSA mapping to DeactivateTraceMode-Res / Error

When the IWF needs to construct a MAP-DeactivateTraceMode Ack message as a result of receiving an DSA command (see sections 7.11.1 step 4), the IWF shall populate sub-parameters of DeactivateTraceMode Res/Error as described below:

DeactivateTraceModeRes:

extensionContainer shall be absent.

DeactivateTraceMode Error:

Values other than SUCCESS within the Result-Code / Experimental-Result AVP shall be mapped onto an appropriate MAP error.

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-12	CT#42	CP-080711			Version 1.0.0 approved in CT#42	1.0.0	8.0.0
2009-03	CT#43	CP-090056	0001		Supported RAT Type	8.0.0	8.1.0
		CP-090056	0002		Trace		
		CP-090056	0004		Context Identifier for Update or Removal of PDN GW		
		CP-090044	0005	2	Ready For SM		
		CP-090044	0006		Handling LCS Subscription Data		
		CP-090056	0007	1	Requesting-Node-Type mapping		
		CP-090056	0008		Parameter mapping correction		
		CP-090044	0010	2	Handling SMS Subscription Data		
2009-06	CT#44	CP-090308	0011		Parameter Mapping	8.1.0	8.2.0
		CP-090380	0013	3	User Data Download		
2009-09	CT#45	CP-090545	0014		Notification of SMS over IP Non-Delivery for E-UTRAN and UE Reachability	8.2.0	8.3.0
		CP-090545	0015		Removal of User Data Handling Principles		
		CP-090545	0016	2	Cancel Location for Initial Attach		
2012-12	CT#58	CP-120714	0039	1	Clarification on EPS Info	8.3.0	8.4.0
2013-06	CT#60	CP-130278	0042	1	Parameter Mapping for Call Barring	8.4.0	8.5.0

History

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